

FLIGHT

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DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

- 1931
- Nov. 14. Rugby. Cranwell v. Woolwich, at Cranwell.
- Nov. 18. "Flying Boats in Empire Defence," Lecture by Wing-Com. R. M. Bayley, before R.U.S.I.
- Nov. 19. "Aircraft Vibration," Lecture by H. Constant, before R.Ae.S.
- Nov. 23. "Diesel Engines," Lecture by H. R. Ricardo, before R.S. Arts.
- Nov. 26. Guild of Air Pilots and Air Navigators, Annual General Meeting.
- Nov. 30. "Diesel Engines," Lecture by H. R. Ricardo, before R.S. Arts.
- Dec. 3. "Wheel Brakes and Undercarriages," Lecture by S. Scott Hall, before R.Ae.S.
- Dec. 4. London Ae.C. Annual Dinner and Dance, at Park Lane Hotel.
- Dec. 4. Hampshire Ae.C. Ball at Portsmouth.
- Dec. 7. "Diesel Engines," Lecture by H. R. Ricardo, before R.S. Arts.
- Dec. 10. "Air Flow—Demonstrations on the Screen by Means of Smoke," Lecture by W. S. Farren, before R.Ae.S.
- Dec. 11. Rugby: R.A.F. Final Trial, at Uxbridge.
- Dec. 12. First Reunion Dinner of Comrades of the R.A. Forces.
- Dec. 17. "Control Beyond the Stall," Lecture by Dr. G. V. Lachmann, before R.Ae.S.
- 1932
- Jan. 14. "Interference," Lecture by E. Ower, before R.Ae.S.
- Jan. 28. "Effect of Height on Range," Lecture by A. E. Woodward-Nutt and Flt.-Lt. A. F. C. Scroggs, before R.Ae.S.
- Feb. 24. "A Flight to Abyssinia," Lecture by Sqdn.-Ldr. J. L. Vachell, before R.U.S.I.
- Mar. 10. "Results with the New Wind Tunnel at N.P.L.," Lecture by E. F. Relf, before R.Ae.S.
- Mar. 16. "Development of Naval Air Work," Lecture by Commodore N. F. Laurence, before R.U.S.I.
- Mar. 23. "High-Speed Flying," Lecture by Sqdn.-Ldr. A. H. Orlebar, before R.U.S.I.
- Apl. 13. "The North-West Frontier of India," Lecture by Maj.-Gen. S. F. Muspratt, before R.U.S.I.

EDITORIAL COMMENT



THE mere fact that the record time from England to the Cape and that from England to Australia has been lowered does not, of itself, cause us any very great jubilation. Stunt flights must give considerable satisfaction to those who indulge in them, and they provide a welcome relief to certain daily papers who judge that their readers have heard enough about the election for the time being.

There are, however, points about these two flights which differentiate them from the ordinary record-breaking event. Let us

Two New Records

first consider the flight to the Cape of Mr. Store and Miss Salaman in a "Puss Moth." Of course, there has been a certain amount of discussion about the degree of credit due to each of the two partners in this adventure. The discussion seems to have caused a certain amount of annoyance and pain to Miss Salaman, which is to be regretted. It is, however, the normal result of the habit cultivated by some papers, of seeking thrills instead of recognising straightforward facts. A young lady, who is a competent but not very experienced pilot, acquires an aeroplane and determines to fly to the Cape in it. Recognising her own limitations, she very prudently enlists the services of a man who is a skilled pilot and navigator. The lady takes her full share of piloting when circumstances do not make too heavy a call upon her abilities and experience. She displays remarkable endurance and pluck. Without the qualities possessed by the man, the flight might easily not have been the success which it has proved to be. Great credit is due to both parties for their share in it. But because some sensational papers made too much of the "flying débutante," and gave Miss Salaman credit for qualities which she could hardly have possessed and probably did not claim, a reaction set in, and it seems that doubt was cast on the abilities which she actually does possess. Such are the services rendered by sensational papers to their victims.

We give this as our view of the case because we wish to do full justice to Miss Salaman and Mr. Store alike. None the less, it is not the human aspect of the flight which chiefly interests us. The flight

is a great triumph for British aircraft and British engines. Comparison with the flight of the late Com. Glen Kidston is unavoidable, both because Miss Salaman deliberately set out to beat his record, and because this flight has accomplished what Glen Kidston implied, if he did not actually say, that British aircraft could not do. When he wanted to teach air transport a lesson in speed, regardless of the fact that the time has not yet come when mails and passengers can be carried in separate classes of aeroplane, he acquired a fast and powerful American machine, the Lockheed "Vega," with a 450-h.p. "Wasp" engine. It was a machine whose powers had been well tested in a number of great flights, including that of Eielson and Sir Hubert Wilkins across the Arctic ocean. He proved that it could get to Capetown faster than a passenger will be able to get there flying by the schedule of Imperial Airways. His flight did not prove much more than that. Now an ordinary "Puss Moth," bought second-hand, has proved that it can do as much. It has actually done more, for it has taken less time over the journey. Its flying hours, however, were greater than those of the "Vega," which means that the two pilots and the "Gipsy" engine had less rest than was given to the "Wasp" and its pilots.

Neither of the flights was an example of how an air mail service ought to be run, and the second of the flights had at least this merit—that it did not set out to teach any lessons. It has, however, shown us that a British aeroplane with a British engine can prove quite as much over that particular stretch of the globe as the American machine was able to prove. Now we hope, though we scarcely expect, that the African record will be given a rest. Further reductions of the time by a few hours, at the cost of over-driving both engine and pilot, will have no value at all. We are looking forward to two other demonstrations which will each have its own value, and will make record-breaking seem a rather childish craze. One of these is the attempt by the Fairey-Napier monoplane to reach the Cape in a non-stop flight. That, if it succeeds, will mark a stage in the development of the long-distance aeroplane which may have very valuable results in the future. The other event to which we are looking forward is the production of the special mail aeroplane which the Air Ministry has asked for from the designing firms. We have used the term "mail aeroplane" in the singular, but we mean the class. Mails will be carried by relays of this machine, stage by stage, and no pilots and no engines will be overworked. Yet the mails should cover the distance in much less time than the record of any single machine, however speedy.

The other great flight of the week has been that of Mr. Butler in a Comper "Swift," with Pobjoy engine. Our pulse does not beat faster because he flew the outward journey faster than Mr. Scott managed to do. The point of this flight is the success of the "Swift" and the Pobjoy, and that success would have been just as striking if it had not broken any record. That this new little machine and new little engine should have done good time over such a long journey is a very striking testimony to the merits of both. Some people were once

inclined to regard the "Swift" as a pretty little toy. The Pobjoy engine was not quite an unknown quantity (the King's Cup race had shown its merit), but it had not previously shown its power of standing up to a really gruelling flight across a great section of the globe. We gave a full description of the Pobjoy engine in our issue of June 5 last. Small and light, with a reduction gear and a silencer, it may be said to introduce a new class of light aero engine. Now that its power of standing up to a long flight has been proved, it will surely have a great future before it.

We offer our very hearty congratulations to Flt. Lt. Nicholas Comper on the success of the "Swift." He first proved his merit as a designer in the Lympne competitions with his series of C.L.A. machines. He was then an officer of the Royal Air Force, and he staked his future when he gave up his commission and became a professional designer. Not a few aircraft designing companies have, alas! gone into liquidation since the war, and the prospects of a new one must always be speculative. Now his little machine has proved itself a world-tourer, and Comper's prospects have correspondingly risen. We sincerely trust that further, and very complete, success awaits him. He thoroughly deserves all that he gets.

❖ ❖ ❖

We beg to offer a hearty welcome to the Marquess of Londonderry on his return to the Air Ministry. Memories are short, and perhaps not everyone remembers that Lord Londonderry succeeded Maj.

**The
New Air
Minister**

Gen. Seely as Under-Secretary for Air in the Coalition Government, when Mr. Winston Churchill combined the portfolios for War and Air. He held office in 1920-21. The times and circumstances were such that even the ablest Under-Secretary could do little for the interests of flying, and so his Lordship is not to be blamed that he was unable to accomplish much. Now the Air Ministry is one of the most important seats in the Cabinet, and we look to Lord Londonderry to give us a taste of the ability which he has amply proved himself to possess. We know that the times are again hard, though in a different way. Economy is the order of the day, and the fighting services are expected to contribute rather more than their share in cutting down the national expenditure. But aircraft are no longer despised, as they were in Coalition days. It is when the income is small that the really able spender has a chance to show his or her brilliance. It may not be possible for Lord Londonderry to bring the number of A.D.G.B. squadrons up to the standard laid down in Sir Samuel Hoare's original programme. We hope, however, that he will see to it that what squadrons we do possess are all equipped with the latest and best types of aircraft. Re-equipment has been all too slow a process in recent years, and though it has lately been speeded up somewhat, still more expedition is very desirable. We trust, too, that the policy of progressive development of flying boats will not be allowed to lapse. In fact, we see plenty of opportunities for the exercise of wisdom lying before Lord Londonderry, and we feel sure that he will not be slow to seize them.



The New "Tiger Moth"

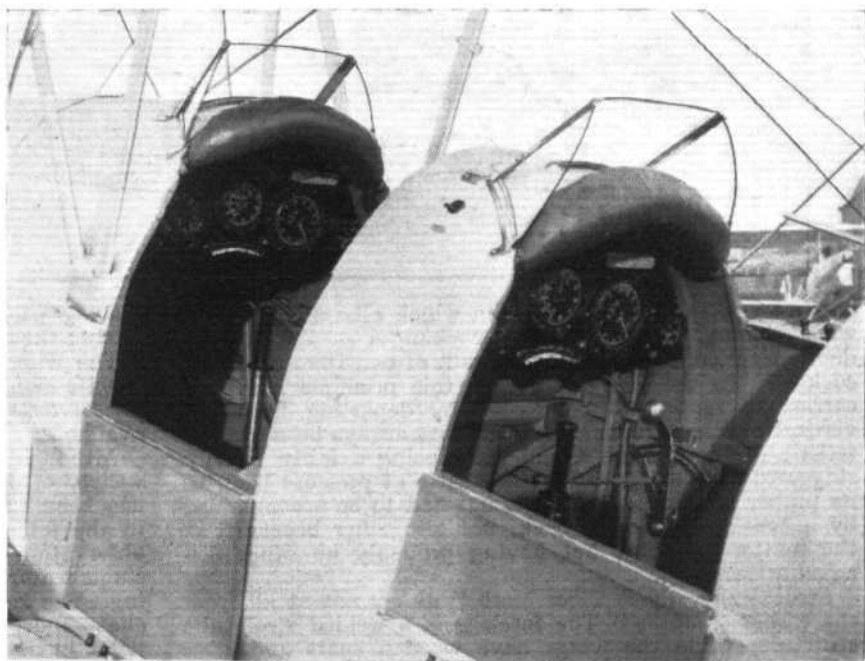
Strictly speaking the sub-title of this article should be "The Tiger Moth is dead. Long live the Tiger Moth." The original "Tiger Moth" was a very diminutive monoplane on which a world's speed record for light planes was established. It was fitted with the first De Havilland "Gipsy" engine. The new "Tiger Moth," described below, is a machine specially designed for training

ECONOMY in training is a subject which every nation possessing an Air Force is studying very intently at the moment. In the great majority of cases economy is sought by choosing for training a type of aircraft which, while reasonably cheap in first cost and maintenance, does not differ too greatly in its flying characteristics from the more powerful service types upon which pilots will have to do their flying after tuition. The old idea of the need for specialised types in the various stages of training dies hard, and, incredible as it may seem, there are still those who believe that efficient training demands something like four different aircraft types.

Provided that the training machine has flying characteristics not too different from those of more powerful aircraft, it would seem that one training type, followed perhaps by a relatively short period of practice on a really high-powered machine to accustom pilots to the roar of the big engine, should do all that is necessary. For this to be possible, the training machine must provide a good compromise, or rather series of compromises. It must be fairly easy to fly, yet not *too* easy. It must be capable of all the usual aerobatic manoeuvres, which is to say, it must be very controllable in all attitudes. It must be capable of carrying a very considerable load in the form of equipment, so that tuition in several subjects other than flying may be possible. But obviously there is no real necessity for the training machine to be capable of all these things simultaneously, provided the change-over from one form of training to another can be made quickly.

We believe that considerations such as those outlined above guided the de Havilland designers in producing the new "Tiger Moth," which is now beginning to issue from the Stag Lane factory in considerable numbers. One batch was delivered recently to No. 3 Flying Training School, Grantham, and others are coming along.

The name "Tiger Moth" was chosen—somewhat unwisely in our opinion—because under the Air Ministry's scheme training machine titles must begin with a T, and no other appropriate "Moth" name complying with that requirement presented itself. Most of our readers will



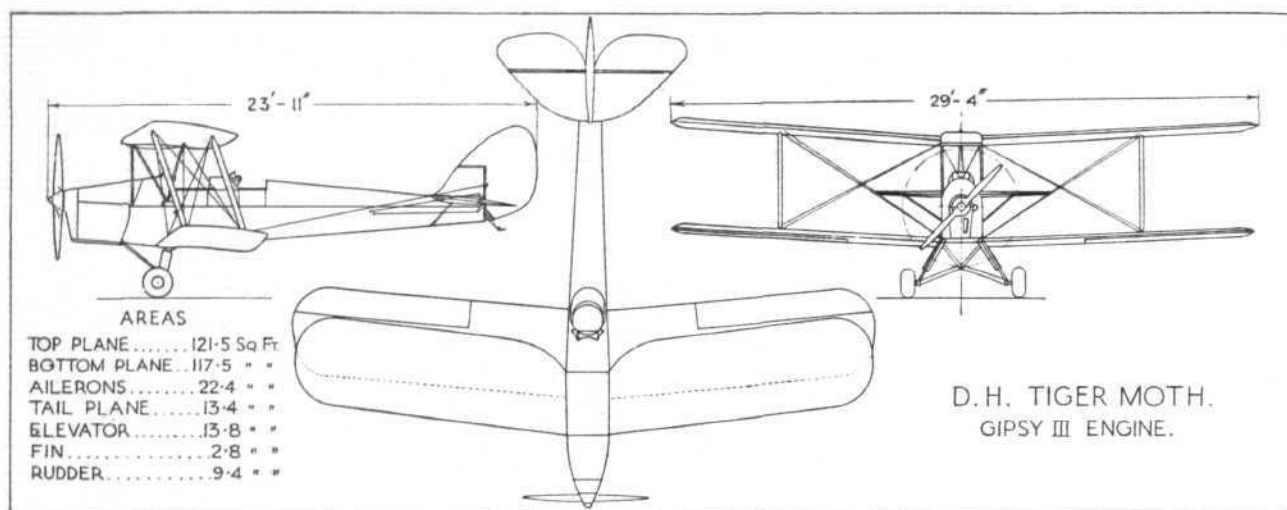
THE CLEAR EXITS: The new dropped doors, the staggered wings, and the shifting of the rear lift wire to a forward point, have resulted in a very free passage out of the machine from the front as well as from the rear cockpit. (FLIGHT Photo.)

remember that some years ago the de Havilland Company produced a very interesting little racing monoplane known as the "Tiger Moth," and some confusion is likely to arise by using the same name for a new type. However, doubtless in a couple of years, when the new "Tiger Moth" will have become familiar to everybody, the original machine bearing this name will have been forgotten, and so, perhaps, any disadvantage which the choice of this name may present at the moment will be of a temporary nature only.

The new "Tiger Moth" retains most of the characteristics of appearance which one associates with the "Moth" machines of all types, but considerable changes have been made, changes which have a profound effect on the practical use of the machine. It may, perhaps, be recollected that some months ago we described and



THE NEW "TIGER MOTH": This three-quarter front view shows the small obstruction to view presented by the Gipsy III engine. (FLIGHT Photo.)



illustrated a type of "Moth" in which alterations to the wing bracing, and some smaller changes in the cockpit doors, resulted in a much easier path of exit from the front cockpit. In the "Tiger Moth" this principle has been carried to its logical conclusion by departing from the vertical biplane arrangement which has always been characteristic of the "Moth" and introducing a fairly heavily staggered cellule. To bring the centre of pressure back to its proper position, the stagger has had to be accompanied by a considerable sweep-back, not altogether beneficial in the matter of looks, but having probably no other disadvantages.

Structurally, the "Tiger Moth" differs not at all from the earlier "Moths." The fuselage is a welded steel tube structure, while the wings have wooden spars and ribs, although quite probably sooner or later an all-metal version will be introduced by producing a set of metal wings for the welded steel tube fuselage. The earlier "Moth" is so well known the world over that it is unnecessary for us to devote space to a description of the constructional features of the "Tiger Moth," and our readers will doubtless prefer to be told something of the respects in which the "Tiger Moth" differs from previous "Moth" biplanes.

The "Tiger Moth" is a tractor biplane with staggered and back-swept wings, and the engine fitted is the de Havilland inverted "Gipsy III," rated at 120 h.p. By staggering the upper wing, the centre-section struts are brought forward, ahead of the front cockpit, and as the doors have been made to hinge along a line quite low over the fuselage, exit from the front cockpit is very easy, and the occupant has as good a chance of using his parachute as has the occupant of the back seat. What further adds to the facility of exit is that the exhaust pipe has been changed to come straight down from the engine instead of running along the side of the fuselage, while the lift

bracing wires both run to the front bottom spar fitting, so that the rear wire does not get in the way at all.

The wings of the "Tiger Moth" do not fold. For a private owner this might be something of a drawback, but for service training there is usually plenty of hangar space available.

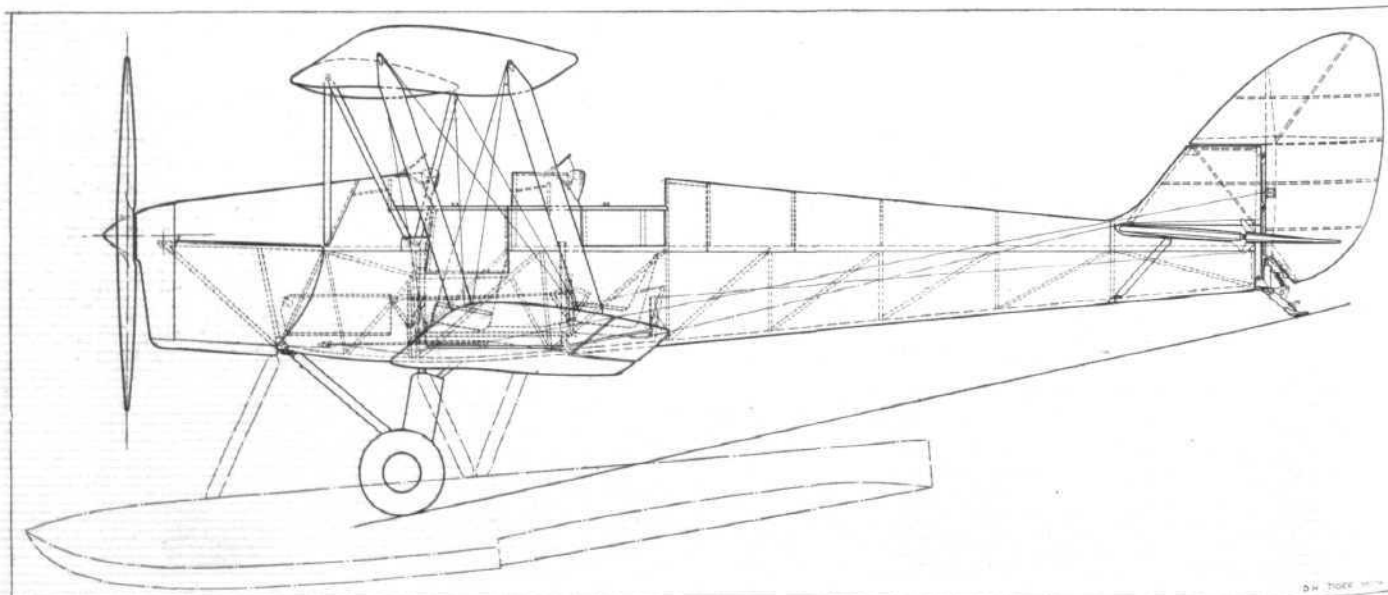
Although the "Tiger Moth" can be used for a great variety of purposes, there are five main functions which it has been specially designed to fulfil. These are training in the following branches of air duties: Flying training, observation and reconnaissance, long-range light bombing, single-seater fighter training and two-seater seaplane training. The fact that the machine is of low first cost and very cheap indeed to operate and maintain should be a great point in its favour in these times of economy. The maximum permissible gross weight of the "Tiger Moth" is 1,825 lb. (828 kg.) for "Normal" Certificate of Airworthiness, and 1,650 lb. (748 kg.) for the "Aerobatics" Certificate. The tare weight varies, of course, according to the duties for which the machine is equipped.

Standard Equipment

A very complete equipment is carried, irrespective of the duties for which the machine is being used at the moment. Dividing this into instruments, fixed equipment and loose equipment, the following are carried under these three subheads:—

Instruments.—Duplicated, i.e., provided in both cockpits, on instrument boards: Airspeed indicator, altitude meter, oil pressure gauge, revolution indicator and inclinometer.

Also duplicated, but not mounted on the instrument boards, are the following: Hughes Compass, III A 6/18 mounted on brackets on the control boxes; when the machine is equipped for wireless, the compass in the front



THE GENERAL LAY-OUT: This side elevation indicates the arrangement of the cockpits, etc., while the three-view general arrangement drawings at the top of the page give the main dimensions.

cockpit is mounted on port side. D.H. strut-type airspeed indicator is mounted on interplane struts, and can be read from both cockpits.

Fixed Equipment.—This comprises the following: Parachute-type seats; luggage locker; inter-cockpit telephones; 3-piece unsplinterable windscreens; D.H. aerobatic harness in both cockpits; parallel motion adjustable rudder bars; dual tail trimming control; dual throttle control; dual control column; split axle undercarriage with Dunlop low-pressure tyres; special wide doors for emergency exit; Essex fire extinguisher; special large cowl rolls; master ignition switch in front cockpit.

Loose Equipment.—Airscrew and cockpit covers; engine and aircraft tool roll; engine and aircraft instruction books; engine, aircraft and journey log books; certificate of airworthiness; certificate of registration.

Special Equipment

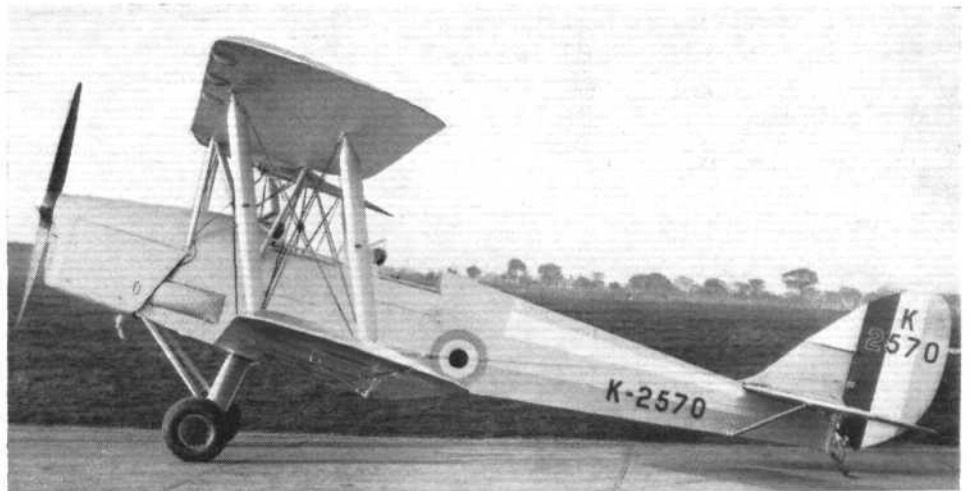
The following special equipment is supplied at extra cost when it is desired to use the machine for duties other than flying training:—Ten-gallon auxiliary petrol tank (larger auxiliary tanks can be supplied at the expense of other load); bomb racks to carry four 20-lb. bombs, complete with release gear; bomb sight; camera gun; gun sight; Marconi A.D. 22 wireless apparatus; P.14 camera with slides and envelopes; parachutes; Handley-Page automatic wing tip slots; slot-locking device, operated from cockpit; metal airscrew; navigation lighting; turn indicator; drinking-water tank; ration boxes, etc.

Flying Training

When the "Tiger Moth" is used for flying training, its tare weight is 1,075 lb. (488 kg.), and with 18 gall. of petrol, $1\frac{1}{4}$ gall. of oil, pilot, pupil, parachutes and harness, and fire extinguisher, the gross weight becomes 1,618 lb. (734 kg.). The maximum authorised weight for aerobatics certificate is 1,650 lb. (748 kg.).

Observation or Reconnaissance

Equipped for these duties, the "Tiger Moth" has a tare weight of 1,075 lb. (488 kg.). The gross weight of 1,700 lb. (770 kg.) is reached by carrying the following:



GOOD LINES: When one becomes accustomed to the downward slope forward resulting from the installation of the Gipsy III engine, the "Tiger Moth" is of pleasing appearance. (FLIGHT Photo.)

bombs can be included. The gross weight is then 1,788 lb. (810 kg.).

Long-range Light Bombing

The tare weight for this duty remains as before, and the load which brings the gross weight up to 1,825 lb. (828 kg.) comprises the following: 28 gall. of petrol and $1\frac{3}{4}$ gall. of oil; pilot and passenger; auxiliary petrol tank; bomb release gear; bomb rails; bomb carrier; bombs (four 20-lb.); parachutes and harness; fire extinguisher; Vickers pump.

Single-seater Fighter Training

For a tare weight of 1,075 lb. (488 kg.) and a gross weight of 1,448 lb. (656 kg.) the machine carries, when equipped for fighter training, the following: 18 gall. of petrol and $1\frac{1}{4}$ gall. of oil; pilot, parachute and harness; camera gun; Aldis sight and bracket; fire extinguisher.

Seaplane Training

For this duty the machine is supplied as a twin-float seaplane, and has then a tare weight of 1,206 lb. (547 kg.). The load is composed of: 18 gall. of petrol and $1\frac{1}{4}$ gall. of oil; pilot and pupil; parachutes and harness; fire extinguisher. These items bring the gross weight up to 1,749 lb. (792 kg.). The maximum authorised gross weight is



THREE-QUARTER REAR VIEW: Both planes are swept back, but only the lower has a dihedral. (FLIGHT Photo.)

18 gall. of petrol; $1\frac{1}{4}$ gall. of oil; pilot and passenger; wireless apparatus; aerial winch and weight; aerial lead-in tube; wireless accumulator; wireless generator; parachutes and harness; P.14 camera, slides and mounting; fire extinguisher. As the maximum weight for normal certificate of airworthiness is 1,825 lb. (828 kg.), there is a good margin left. As an alternative loading, three 20-lb.

1,750 lb. (793 kg.), so that as a seaplane the "Tiger Moth" is loaded up to its capacity.

Performance

When loaded to a gross weight of 1,643 lb. (745 kg.), the following official speed figures were attained (the first figure is the altitude in feet, and the second the speed in

m.p.h.):—Sea level, 109.5 ; 2,000, 107.5 ; 3,000, 106.5 ; 5,000, 104.0 ; 6,500, 102.5 ; 10,000, 97.0 ; 13,000, 91.0 ; 15,000, 85.5. The stalling speed is 46.5 m.p.h.

Climbing Tests			
Standard Height ft.	Time from Start		Rate of Climb ft. per min.
	m.	s.	
Sea Level	700
1,000 ...	1	29	650
2,000 ...	3	5	605

Standard Height ft.	Time from Start		Rate of Climb ft. per min.
	m.	s.	
3,000 ...	4	48	560
5,000 ...	8	40	480
6,500 ...	12	0	420
10,000 ...	22	13	280
13,000 ...	36	12	160
15,000 ...	54	0	80

Estimated absolute ceiling, 17,000 ft.

RE-EQUIPPING THE R.A.F.

THE list of new aircraft equipment to be issued to squadrons of the R.A.F., which was published under date November 5, contains several items of considerable interest. No. 1 (Fighter) Squadron is to get the "Fury" in place of the "Siskin." No. 1 F.S. is stationed at Tangmere, which it shares with No. 43 F.S., and thus Tangmere becomes an all-Fury aerodrome. No. 25 F.S., which was originally selected as the second interceptor squadron, will now have to wait for its new machines. We have already expressed our doubts as to the wisdom of the policy of stationing interceptors on the coast; but if it is to be tried out, certainly it is well to make the experiment complete.

Of equal interest is the notification that No. 4 (Army Co-operation) Squadron, at South Farnborough, is to receive the "Audax" in place of the "Atlas." The name "Audax" is new and unfamiliar, but it implies the Army co-operation version of the Hawker "Hart." It has been an open secret for some time that the "Hart," possibly our most versatile aeroplane, was to be tried out for Army co-operation work. The present prospect is that our Army aeroplanes will have to do their work without the protection of fighter squadrons, as all the latter belong to A.D.G.B., and none have been allocated to the Army. Therefore the A.C. machines will have to defend themselves against attack, and will require higher performance than is necessary for strictly co-operation work. The speed of the "Audax" will also be useful for certain classes of Army bombing work.

Two A.C. squadrons in India still carry on with the good old Bristol Fighter. These are No. 28 at Ambala and No. 31 at Quetta. The re-equipment programme says that India is to receive the "Hart" in place of the Bristol Fighter. Presumably that means that these two A.C. squadrons will be so re-equipped. Why, in this case, the replacement machine is described as "Hart" instead of as "Audax," we are not clear. If the two squadrons in question were bombers, the term would be comprehensible, but all the four bomber squadrons in India, as well as the two other A.C. squadrons, are equipped with the "Wapiti," and are not likely to change in the near future.

In the Fleet Air Arm, No. 408 (Fleet Fighter) is to get the "Nimrod" (the ship-plane version of the "Fury") vice the "Flycatcher," but this notification merely substitutes No. 408 Flight for No. 402 Flight, which was originally chosen for this re-equipment. The Base Training Squadrons at Gosport and Leuchars are also to get the "Nimrod" in place of the "Flycatcher."

The substitution of "Bulldogs" for "Siskins" proceeds steadily, and No. 41 (Fighter) Squadron at Northolt

is the latest to be chosen for this re-equipment. When the next Air Exercises are held, we hope that there will be no more cases of fighter squadrons being unable to bring to action raiding formations which they have sighted, on account of the insufficient speed of the fighter aeroplanes.

The rest of the programme deals mainly with training organisations. The last Bristol Fighters in this country, namely, those at No. 2 Flying Training School, Digby, at Halton, and the Station Flights of Upper Heyford and Duxford (which care for the well-being of the Oxford and Cambridge Air Squadrons, respectively) are all to be replaced by the "Atlas." The complete list is given below. The dates given are, however, only approximate, and are liable to alteration.

Type	Unit	In replacement of	Approximate date
Atlas T.M.	No. 2 F.T.S. ..	Bristol Fighter ..	October, 1931.
"	Station Flight, Duxford	Bristol Fighter ..	October, 1931 (advanced from November, 1931.)
"	Halton ..	Bristol Fighter ..	Oct./Nov., 1931 (advanced from December, 1931.)
"	Station Flight, Upper Heyford	Bristol Fighter ..	Oct./Nov., 1931 (advanced from November, 1931.)
Audax ..	No. 4 Squadron	Atlas A.C. ...	November, 1931.
Avro 504N ..	No. 5 F.T.S. ..	Moth (Gipsy I) ..	November, 1931.
Bulldog ..	No. 41 Squadron	Siskin IIIA (Super-charged)	November, 1931.
Fury ..	No. 1 Squadron (in lieu of No. 25 Squadron)	Siskin IIIA (Super-charged)	Nov./Dec., 1931.
Hart ..	India ..	Bristol Fighter ..	To be shipped during Oct./Nov., 1931.
Moth (Gipsy III)	Kai Tak and Singapore	1 I.E. each ..	To be shipped during December, 1931.
Tutor (Lynx)	No. 3 F.T.S. ..	Tutor (Mongoose)	November, 1931.
Nimrod ..	No. 3 F.T.S. ..	Tomtit (Mongoose)	November, 1931.
"	No. 408 Flight (in lieu of No. 402 Flight)	Flycatcher ..	Oct./Nov., 1931 (postponed from September, 1931)
"	Base Training Squadron, Gosport	1 I.E. ..	Nov./Dec., 1931 (postponed from October, 1931.)
"	Base Training Squadron, Leuchars	Flycatcher (1 I.E.)	
Victoria Wapiti, Mark IIa	C.F.S. ..	1 I.E. ..	November, 1931.
"	Armament and Gunnery School	Wapiti, Mark II, and Bristol Fighter	October, 1931.
"	School of Photography	1 I.E. ..	November, 1931.

BROOKLANDS' GREAT LOSS

BROOKLANDS FLYING SCHOOL suffered a terrible loss on Sunday last, November 8, when Capt. E. A. Jones was killed at Hendon. "Ted" Jones, as everyone knew him, was in charge of instruction at Brooklands and of the practical and navigation side of the newly-formed College of Aeronautical Engineering. He was one of the hardest workers and the best liked men in aviation, and his death will hit everyone severely.

It appears that he was flying in the front seat of a Moth which had recently been fitted with full blind flying equipment, and was being passed out by Flt. Lt. W. E. P. Johnson as an instructor in this class of flying. Brook-

lands have just decided to provide a blind flying course for their pupils, and Flt. Lt. Johnson, who has made a special study of blind flying instruction at the Central Flying School, Wittering, had just assessed Capt. Jones as fully competent when the accident occurred. It seems that the mast supporting the "wind-sock" was painted grey, and that on coming in to land this was not seen in time to be avoided. Jones being in the front seat received severe internal injuries, from which he subsequently died, while Flt. Lt. Johnson damaged his hand and suffered from shock, but was not detained.

We offer our sincere sympathies to Capt. Jones' relatives and all those connected with Brooklands.

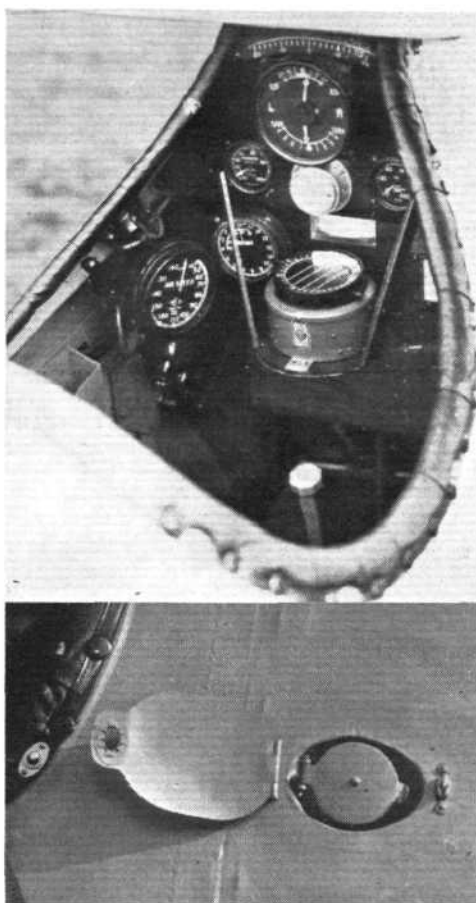
Butler's Flight to Australia

A SMALL pilot in a small machine has, by a small margin, it is true, beaten the record for the flight from England to Australia of 9 days 4 hr. 11 min. established by Mr. C. W. A. Scott last April. Mr. C. A. Butler, who, as reported last week, left Lympe in his Comper "Swift" (75-h.p. Pobjoy engine) on October 31, after steadily gaining on Mr. Scott's time until towards the end, succeeded in accomplishing the journey in 9 days 2 hr. 29 min., thus beating the record by 1 hr. 42 min. The main achievement of this flight, however, is the magnificent performance of the little Comper "Swift" monoplane and its comparatively new Pobjoy "R" engine—apart, of course, from the remarkable "endurance" of Mr. Butler himself.

It may be of interest to note here that a few years ago Mr. Butler, who is a native of Shirley, near Birmingham, designed and constructed at Cootamundra, N.S.W., a high-wing monoplane not unlike the "Swift" on which he has now broken the record.

In our report of Mr. Butler's flight in last week's issue we left him speeding from Karachi on the fifth day of his flight, November 4. His previous stages may be followed from the accompanying log.

Reports of his progress from Karachi have been somewhat



The Comper "Swift" with 75-h.p. Pobjoy "R" engine. The top illustration shows the assortment of Smith's aero instruments and the special drinking-water supply on this machine. (FLIGHT Photo.)

vague, but it appears he flew to Rangoon, where he arrived on the morning of November 5. His departure from Dumdum aerodrome was delayed for some time by a torrential rainstorm with high wind, but in spite of further bad weather ahead he managed to reach Akyab that afternoon.

From Akyab he proceeded to Rangoon, where he arrived on the morning of November 6, and after a halt of one hour for refuelling he left again for Victoria Point. Here he was again held up by a strong head wind—a great misfortune, for up to this he had been gaining steadily on Scott's time.

However, he pushed off as soon as possible, and, making a halt of but 50 minutes to refuel at Singapore, arrived at Batavia in the evening of November 7. He left again in the early hours of the following morning for Koepang. After a brief halt at Koepang he started on the final over-sea hop to Darwin on November 9.

A large crowd greeted him when he landed at Darwin at 4.23 p.m. (local time), and as soon as he had ascertained that he had beaten the record, he requested that news of his safe arrival be sent to his mother. He said he was not a bit fatigued and had had an excellent trip except for the last sections.

On hearing of his safe arrival in Australia, the Marquis of Londonderry, Secretary for Air, sent the following message to Mr. Butler:—

"On behalf of the Air Council I send you warmest congratulations on completion of your splendid flight and on establishing a new record from England to Australia."

With regard to the actors, large and small, in this splendid performance, the little Comper "Swift" should be familiar to all our readers, for it has been described and illustrated in FLIGHT on many occasions (a detailed description appeared in our issue of January 17, 1930, and briefer descriptions in those for April 4, 1930, and November 21, 1930), so we need hardly refer to it again here, except to point out that machine and engine were absolutely standard, apart from the fitting of extra tankage. The latter consisted of one 14½-gal. and one 27½-gal. tanks, which brought the load carried up to about the equivalent of two passengers in addition to the pilot; the cruising range was 1,025 miles. With the petrol carried, 1½ gal. of drinking water, plus 5 gal. of oil, the machine had a gross weight of 1,160 lb. In spite of this it took off in a run of 125 yd. in 8 sec.

The 75-h.p. Pobjoy "R" engine has also been fully described in FLIGHT (June 5, 1931), and likewise needs no further comment here. We might mention, however, that a large number of the parts for this engine, including the cylinder barrels, heads, and pistons, etc., are manufactured by the Mollart Engineering Co., of Queen's Road, Thames Ditton.

As on the record flight to the Cape, K.L.G. plugs, B.T.H. magnetos, and Smith's Aero Instruments (including

Log of Flight

			Approx. Miles
Oct. 31	..	Depart Lympe, 5.10 a.m.	..
" 31	..	Naples	990
Nov. 1	..	Brindisi-Athens	560
" 2	..	Aleppo-Baghdad	1,200
" 3	..	Basra-Jask	1,100
" 4	..	Karachi-Jansi	1,300
" 5	..	Calcutta-Akyab	1,050
" 6	..	Rangoon-Victoria Point	900
" 7	..	Singapore-Batavia	1,500
" 8-9	..	Koepang	1,300
" 9	..	Darwin, arr. 4.23 p.m. (local T.) ..	525
Total			10,425

the Huson compass) were fitted to Mr. Butler's "Swift." A Reid & Sigrist turn indicator was also fitted, and the makers have been informed that "it gave the fullest satisfaction to the pilot during the journey, and was of particular value in the particularly adverse weather conditions experienced."

The Claudel Hobson carburettor was another of the important engine components, while the machine was equipped with Goodyear "balloon" tyres and doped with Cellon. Vacuum "Mobile" oil and fuel supplied the necessary meals for the engine, which, in spite of its hard task, was by no means greedy.

The Flight to the Cape

Record Beaten by 28 Hours

MISS PEGGY SALAMAN and Mr. Gordon Store, who set out from Lympe in the former's D.H. "Puss Moth" on October 31, with the object of beating the late Com. Glen Kidston's record flight between England and Cape Town, have gloriously succeeded in their effort. By hard flying—a good deal of it by night—and skilful navigation they accomplished the seven thousand odd miles in 5 days 6 hr. 40 min., beating Com. Kidston's record by about 28 hr. Their total flying time was 64 hr., Com. Kidston's being 56 hr. We have already recorded the greater part of this flight in our last issue, when we left Miss Salaman and Mr. Store at Bulawayo, with only 1,250 miles between them and their goal. It may be as well, however, if—to make our story complete—we repeat here in a few words the early stages of the flight from the start.

They left Lympe at 11 p.m. on October 30 and, landing at Le Bourget and Rome, where brief halts were made, arrived at Athens the following evening. Proceeding early on the morning of November 1 they flew to Khartoum, which was reached on the morning of November 2, halts having been made at Cairo and Aswan. The next stage to Juba was started almost immediately, and early the following morning, November 3, they proceeded to Entebbe. After a short rest here they set out once more for Mpika, but as darkness fell they found themselves over wild country between Abercorn and Broken Hill, and, in order to avoid flying in hilly country in the dark, they decided to land. Eventually a suitable spot was found, but in landing disaster was narrowly averted, as the tail of the machine hit a tree, resulting in a certain amount of damage to the former. The night was spent in the bush, and next morning a clearing had to be made in the bush—not without considerable difficulty—before the machine could take off and proceed to Mpika, where they refuelled. From here they flew on to Bulawayo, and thence to Kimberley. Starting from Kimberley early next morning, November 5, Miss Salaman and Mr. Store set out on the final stage of their flight, arriving at Maitland Aerodrome, Cape Town, at 7.40 a.m. (5.40 a.m. G.M.T.), where, in spite of the early hour, a crowd had gathered to welcome their arrival. They were received by the Mayor and ex-Mayor, and stated that they could have arrived sooner, for they had cruised along at 90 m.p.h. admiring the gorgeous mountain scenery!

Interviewed by the Cape Town correspondent of the *Daily Telegraph*, Miss Salaman stated that:

"My share in the actual flying was fifty-fifty. Out of 64 hours' flying I flew 32 hours. Also I made several landings, including the final one at Cape Town.

"I piloted the machine nearly the whole way from Le Bourget to Rome, all round the Isles of Greece, from Cairo to Aswan, from Khartoum to Juba, most of the way from Entebbe to Abercorn, and from Mpika to Bulawayo, the whole way from Bulawayo to Kimberley, and from Kimberley to Cape Town.

At the Lord Mayor's Banquet

REPLYING to the toast of the Imperial Forces at the Lord Mayor's Banquet, the Marquess of Londonderry, Air Minister, said that Defence not Defiance was the aim and object of British policy. He said that we had given the world gestures in abundance of our passionate conviction that peace must be maintained. It would be foolish to abolish, or to weaken still further, that index of national security which is embodied in the maintenance of the Imperial Forces of the Crown.

"Aircraft Vibration"

On Thursday, November 19, Mr. H. Constant will read his paper on Aircraft Vibration before the Royal Aeronautical Society. The paper describes the work on Air-

"I want to pay enormous credit to Mr. Gordon Store, my navigator. He was splendid, and he worked at the engines every night. He must have nerves of iron. Alone I could not possibly have come through.

"It has been a tremendous strain, for I lived mostly on drops of water from a bottle and tablets of compressed malt, but I feel it was worth while."

Mr. Gordon Store—who, by the way, is a native of Kimberley—was equally enthusiastic about his partner, and said: "I give Miss Salaman every credit for a truly magnificent performance. She shared the time at the joystick, and I wish it to be clearly understood that my job was navigator. Miss Salaman was first pilot. It was very easy going—just sitting and guiding. We had perfect weather with the wind on the tail. The only spots of dirty weather we encountered were over Corsica and Mafeking."

It is stated that South Africa is giving a special welcome to Mr. Store, who, however, says he wants to "disappear" for a few days to an unknown destination and address!

Meanwhile, numerous messages of congratulation have been sent to Miss Salaman and Mr. Store, chief of which is one from His Majesty King George.

Lord Amulree, the retiring Secretary of State for Air, sent the following telegram:—

"On behalf of the Air Council I congratulate you and Mr. Store most warmly on your record-breaking flight from England to South Africa in under 5½ days. Your courage and endurance have won universal admiration, and the flight has not only brought England and South Africa appreciably nearer, but has given yet another striking demonstration of the capabilities of British aircraft and engines."

Log of Flight

		Approx. Miles
Oct. 30	.. Depart Lympe, 11 p.m.	
" 30-31	.. Le Bourget-Rome-Athens	1,550
Nov. 1-2	.. Cairo-Aswan-Khartoum	1,700
" 2	.. Juba	750
" 3	.. Entebbe-Mpika	1,200
" 4	.. Bulawayo-Kimberley	1,300
" 5	.. Cape Town, arr. 5.40 a.m. (G.M.T.)	550
Total	..	7,050

We must not conclude our account of this remarkable record flight without reference to some of the aids to its success. The de Havilland "Puss Moth," with its "Gipsy" engine, has again made good in long-distance flying, and hardly needs further comment. Working in complete harmony with the "Gipsy" engine we have B.T.H. magnetos, K.L.G. plugs and the Fairey metal airscrew. Smith's aviation instruments, together with the Kelvin, Bottomley & Baird "K.B.B.3" aero compass, played their part admirably in the control and navigation of the machine. Finally, Shell oil and petrol, with that wonderful organisation for supply, played a by no means unimportant part in the flight.

craft Vibration which has been carried out at the Royal Aircraft Establishment. It shows the study which has been made, and the results which have been obtained. The various sources of vibration are considered, the effect on the fuselage of engine vibration and airscrew vibration, and the physiological effects. The paper finally considers how serious vibration may be cured. The paper, which will be illustrated, will be delivered at 6.30 p.m. in the Lecture Theatre of the Royal Society of Arts, 18, John Street, Adelphi, W.C.2. Mr. Constant has been engaged for the past three years in the engine department of the Royal Aircraft Establishment and has studied, in addition to aircraft vibration, such problems as Supercharging, Range of Aircraft, Torsional Vibration of Crankshafts, etc.

The Home of Rolls-Royce Engines

"Rolls-Royce" is used as an adjective denoting the highest quality and no greater tribute can be paid to Rolls-Royce cars and aircraft engines than this fact, for its use is world-wide and it is coupled with any and every type of article manufactured by man

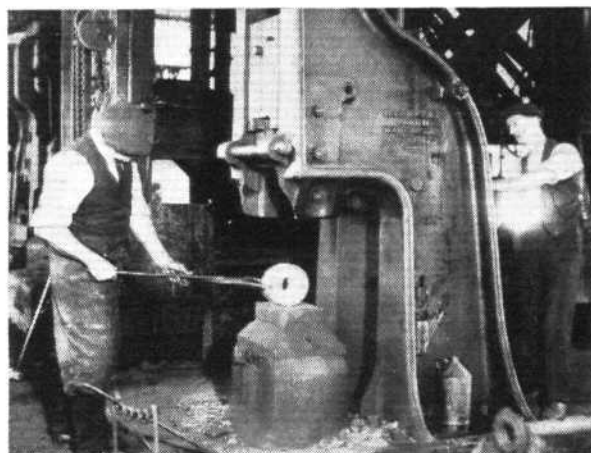
A VISIT to the Rolls-Royce works is a privilege which everyone interested in engineering should endeavour to have granted them. The education of an engineer is not complete if he has not been there. Other factories may be the homes of equally fine workmanship, but no factory with which we are acquainted gives one such an immediate sense of assurance that its productions must be of the very best. This feeling is difficult to attribute to any particular feature of the works, for everything there at Derby fits together to achieve that object.

One drives from the station, probably in a Rolls-Royce car if one is making an official visit—a subtle attention which automatically puts one in an appreciative frame of mind—along somewhat narrow and drab streets. Just before reaching the factory you turn out of these dismal surroundings and up a fairly wide, clean-looking road at the end of which are the works. On the left-hand side is a bright and cheerful-looking brick-built canteen, while on the opposite side of the road are the works themselves. The first glance at these makes one think of quality, and the highest quality at that. Everything is clean; there is none of that dilapidated look about the roofs, eaves, or paths between the shops. The notice boards which are freely erected all over the works have a particularly opulent looking kind of green lettering on a white ground. It must not be thought that such things are necessarily of an expensive form; they are not, but they have just that quiet air of quality about them which distinguishes them from a common or garden factory notice in much the same way as a quietly but expensively dressed woman is distinguished from her more showy sisters.

In the shops the same hall-mark stamps everything, from the workmen themselves to the final products. We were naturally mostly interested with the aircraft engine



Finishing a mould for casting part of the "Kestrel" cylinder block casing. (FLIGHT Photo.)

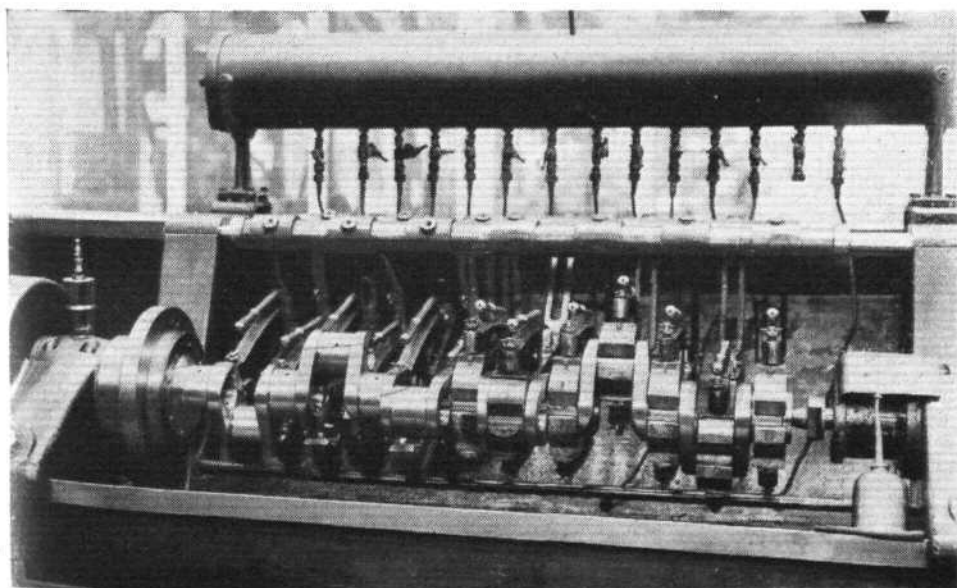


Forging a blank for one of the engine reduction gears. (FLIGHT Photo.)

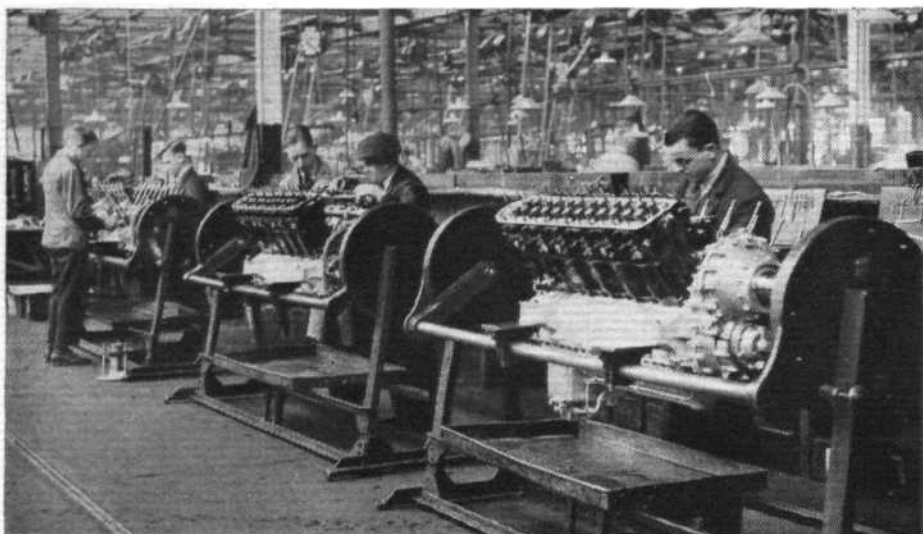
activities of the firm, and for that purpose a trip was made with Mr. Tresilian around the experimental and production departments.

Our first port of call was the experimental department, where we had the pleasure of meeting both Mr. Rowledge, on whom, under Sir Henry Royce, falls the design work of the aero engines, and Mr. Hives, who is in charge of the experimental department. We were fortunate in being able to examine all parts of the "R" engine which was used by Flt. Lt. Stainforth when he raised the world speed record to 407.5 m.p.h. (655 km.p.h.). The condition of all parts is a source of great surprise to all who know anything about the work which this engine did during that flight. The signs of wear are almost imperceptible, a fact which will astound all those who, after reading the "Daily Press," were under the impression that this engine was merely a stunt, hotted up to give its enormous output for a very limited time. Actually, the designation "sprint engine" was a misnomer, for it was similar in every way to the engine Flt. Lt. Boothman used during the Schneider Trophy Contest, the greatly increased power being obtained by using a modified fuel which allowed the engine to work at a more efficient temperature without affecting the power output. So effective was this fuel that an extra several hundred horsepower was obtained. The consumption was, however, much too large to have permitted its being used during the Schneider Trophy Contest.

After leaving the experimental department, where we saw many things about which we are not allowed to speak, we went on to the test beds. One of the first we saw was specially rigged for



Lapping-in the big end and crankshaft bearings; the seven bearings on the right have the laps in place. (FLIGHT Photo.)



The end of the assembly line of Rolls-Royce "Kestrel" engines. The distance at the back of the photograph gives some idea of the size of this workshop. (FLIGHT Photo.)

investigating the problems of evaporative cooling. Rolls-Royce as a firm can probably claim to have a greater knowledge of this form of cooling and all the problems involved than any other engine firm. They have carried out, and are still continuing, numberless tests with condensers of varied shapes and capacities, and have now arrived at the stage when their knowledge is great upon the subject. We understand that, contrary to general belief, the engine does not, to all intents and purposes, have to be modified at all. What this form of cooling really comes to is this. Instead of the cooling water being taken away from the cylinder head before it has absorbed all the heat it can, *i.e.*, before it is boiling, it is arranged to be circulated so that when it does come away it is a mixture of steam and heavily laden water vapour. This is then taken to the condenser which is not at all unlike a normal radiator, but of smaller size, where it is condensed back into water. This water then falls to the bottom to a collector tank, whence it is pumped back into the engine cooling system. By this method the decrease in size of the condenser as compared to the normal radiator saves a good deal of weight, and the fact that the whole weight of water in the radiator is done away with still further contributes to this saving. On the test bed we saw a "Kestrel" engine running with an airscrew, and the condenser so arranged that it could be raised or lowered out of the slipstream at will.

The equipment at Derby necessitates a large number of test beds, and there is a double row under cover where the engines may be tested on the brake. A "Kestrel" engine was undergoing such a test, during our visit, in the self-contained test house which is provided for each brake.

To get even a clear idea of such a works as those at Derby one would have to spend several days there going round quietly and not like we were able to do for merely a matter of a few hours. We had, therefore, to chop about from shop to shop, seeing that which we thought was most interesting.

In one of the first shops was an assembly line of "Kestrel" engines. Just behind this line was the Avery connecting-rod balance; an example of the care which is taken to ensure that every part of the various Rolls-Royce engines is as near perfect as possible. This shop was just one of the few large machine shops which could hardly be distinguished one from another by a stranger. They are all laid out on the square principle with overhead shafting to drive the machinery. The cleanliness of all these shops strikes every observer, for, although such is usually found in any aero engine works, one does not expect it in a motor car works; probably this is just one of the

reasons why the Rolls-Royce motor car is labelled "the best in the world."

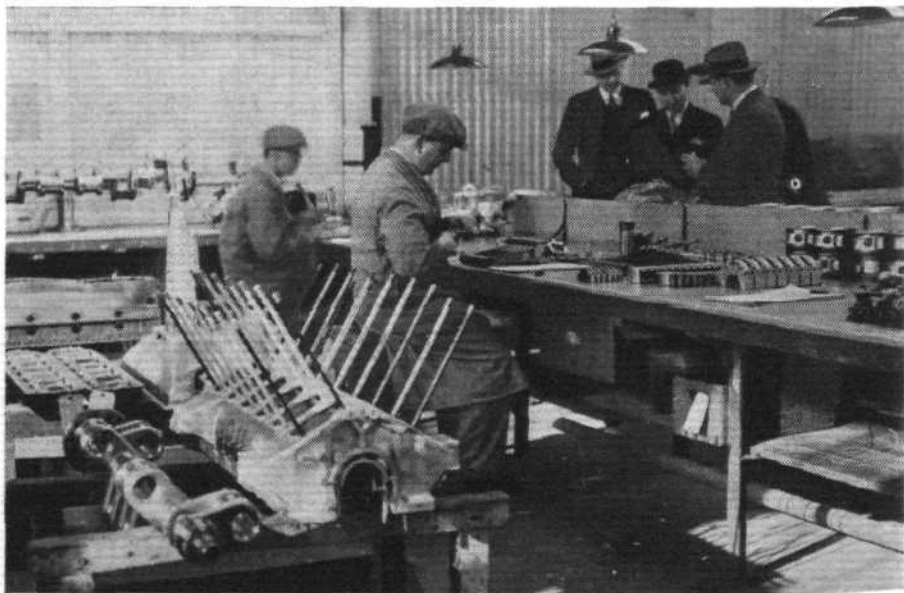
In the test department we found Mr. Plattford, who is in charge, showing a group of French journalists round; he is proud of his department, and well he may be. It is in here that all the engines are stripped down after test and then reassembled after very careful inspection.

A visit to the light alloy foundry disclosed the fact that Rolls-Royce have little to learn about the casting of light alloy parts. They were among the pioneers of research work on light alloys, and have now turned their knowledge of the metal itself over to High Duty Alloys, Ltd., who produce the ingots from which Rolls-Royce themselves make their cast parts. Mr. Hall, who was responsible for the work done in this direction has established himself as one of the leading experts in the country on this particular subject. Casting such a part as the outer cylinder block of a "Kestrel" engine is no easy job, but to see the way the

workmen do it here one would think that it was merely a hobby. As a matter of fact the men working on the aero engines do seem to treat their work as a hobby if one is to judge from the keen interest in it which they take. This attitude was very apparent and undoubtedly accounts to a large extent for the excellence of their workmanship, and thus the wonderful results which are consistently expected from, and obtained from, these engines.

Anyone who is interested in machine tools will find a great deal to attract him in this factory. Naturally in machining up the parts of the engine there are many intricate operations which entail the use of extremely interesting machine tools. For example, the diffuser and the rotor of the blower have to be finished with an almost glass-like finish, as the speed of the mixture through the blower may be as high as 1,000 ft./sec., and any irregularities would cause serious disturbance to the flow. As one would naturally expect, all the bearings are most carefully lapped, and in the case of the crankshaft, at any rate, this operation is done by machinery.

Another test department which is no less important than the engine test house is the shop where carburetors and superchargers are tested. Here one finds an assortment of apparatus, which will give the efficiency of these parts and also a rig for testing out the petrol pumps. That such tests are necessary is shown by the fact that the gear pump for pumping the fuel supply of a standard "Kestrel" engine has to pass a proof test which is equivalent to sucking from a depth of 12 ft. and dis-



A corner of the Test Shop; the inspectors are examining a series of "Kestrel" parts, while Mr. Plattford (on the right) explains some technical details to his visitors. (FLIGHT Photo.)

charging against a similar head—no mean feat for a gear pump!

One of the most amazing things about the preparation of the Schneider Trophy engines is the fact that although several engines were tested to breaking point on the test beds, not a single mechanic was hurt at all!

Such in brief is the place where the Rolls-Royce engines are made. In a short article such as this it is impossible to do justice to these works, but we hope that our readers will have gained some idea of the reason why the Rolls-Royce products have acquired and deserved the name of being of the very highest class obtainable.



Airisms from the Four Winds



Paris-Madagascar Record

THE French airmen, Moench and Burtin, who left Marseilles on October 30, arrived at Antananarivo, Madagascar, on November 5, having flown from France to Madagascar in 6 days 9 hours 45 minutes, which is a record for this flight. The previous record from Paris to Madagascar was set up in November, 1929, by three French airmen, M. Bailly, M. Reginensi, and M. Marsot, in 9 days 6 hrs.

The Cyprus Disturbances

THE troop-carrier aeroplanes have now left Cyprus. It is stated that the names of two aircraftmen, Clarke and Pretty, have been sent up for recognition on account of the initiative which they showed when on the steamer "El Gharib," which was delayed by rough weather and ran short of food while carrying military stores to Cyprus. These two aircraftmen rigged up their wireless set and kept the authorities informed of the position of the vessel.

Exploration of the Upper Air

PROFESSOR PICCARD and Dr. Kipfer will not make another balloon ascent into the stratosphere, but another ascent will be made next summer by two other scientists working under the direction of Professor Piccard. M. Max Costyns, a young Belgian physicist and engineer, has been asked by the Professor to take his place. M. Costyns is head of the laboratory of physics at the Queen Elizabeth Institute in Brussels. A new type of gondola is to be designed for the coming ascent.

Swedish Air Force Officials in Trouble

A COMMITTEE which has been inquiring into the conditions of the Swedish air service for the last eight months has made a report of 350 pages to the Minister of Defence, in which it is recommended that four officials should be dismissed. Their names are:—Gen. Amundsen, chief of the Air Force; Cmdr. Lubeck, his chief of staff; Col. Fogman, deputy chief of staff, and Chief Engineer Fjallback. It is stated that Col. Lubeck will be tried by

court martial. He is alleged to have received bribes in the form of long-term loans.

The "Akron" Carries 207 People

THE large U.S. Navy airship "Akron" left Lakehurst, New Jersey, for a trial flight on November 3 with 207 persons on board.

The Air Exercises

THE Air Ministry official report of the amount of flying carried out in the Air Exercises last summer shows the following figures. Blueland was the bombing power and Redland the defensive side. The total flying hours were:—

	Day.	Night.
Blueland	807.35	356.25
Redland	554.10	73.35
Friendly Bombers	124.05	26
	1,485.5	456

(Aggregate .. 1,941.5).

Squadron Averages.	Hrs.	Mins.
Redland	52	19
Blueland	116	24

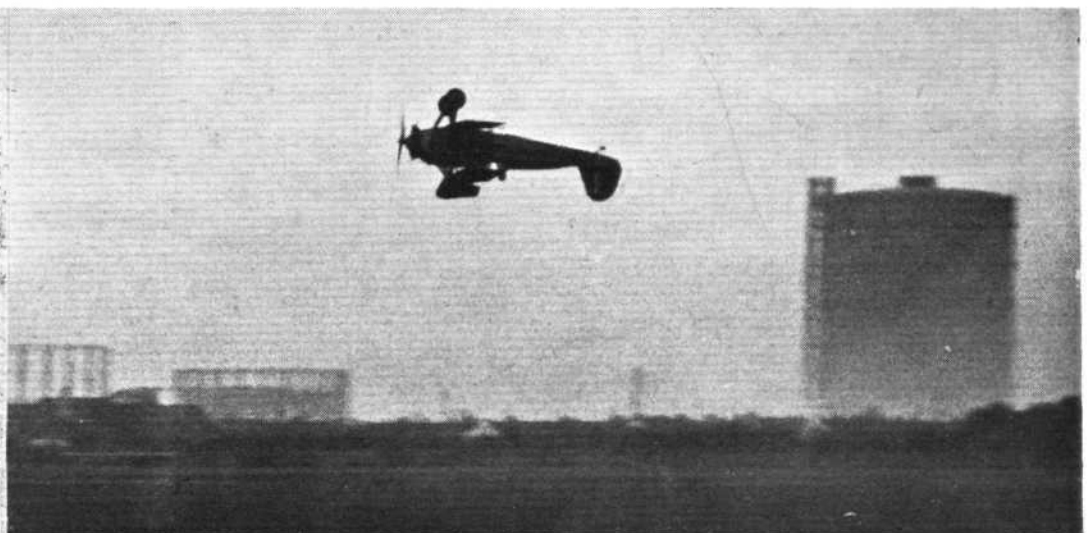
Type analysis (average hours per squadron):

	Hrs.	Mins.
Night Bomber Squadrons	100	30
Day Bomber Regulars	136	24
Day Bomber Auxiliaries	108	12
Fighter Squadrons	52	19

There was much bad weather, yet not one serious accident or incident occurred.

Air Navigation along Churchill River

A REMINDER of the growing importance of aeroplane travel in Canada's north country is the issue by the Topographical Survey of the Department of the Interior of two air navigation maps of the Churchill River which together take in a strip extending 200 miles upstream from Church Harbour. Copies are available to the public for a nominal fee. In this country aerial travel is by the use of sea-



A TOPSY-TURVY WORLD: Herr Achgelis has gained fame in Germany by his extraordinary upside-down flying very close to the ground. He approaches the aerodrome in an inverted dive, and when a few feet from the ground does a bunt into the upright position, from which he half-loops again into the inverted position. The machine is a Focke-Wulf "Kiebitz," with wings of bi-convex section, specially strengthened for these evolutions. Herr Achgelis (left) is seen in the larger photograph flying upside-down at Heston. On this occasion he was flying quite high.

(FLIGHT Photos.)



A FIRST PUBLIC APPEARANCE: The Saro-Percival three-engined monoplane (Gipsy III) paid a visit to Heston on Saturday last, piloted by Mr. Percival himself, who had just brought the machine over from Martlesham where it had been undergoing official tests. Ability to fly on any two of the three engines is one of the features of this machine. (Flight Photo.)

planes in summer and ski-equipped planes in winter, the open water areas forming natural landing places for the seaplanes. Hazards on the river itself are in the rapids and falls, and these are shown in red for ready identification. Also, inasmuch as there are practically no cultural features, except for the region of the harbour itself, the four-mile scale was employed instead of the eight-mile common to such maps in settled regions. The large scale is of greater assistance to the aerial navigator in picking out the various natural features on the map, principally the lakes, rivers and streams. For assistance also in computing distances travelled, figures giving mileage for each five miles are placed along the borders. In the compilation of these strip maps, in addition to the field data obtained by the Topographical Survey, use was also made of information supplied by the Department of Marine, and of oblique aerial photographs taken through the co-operation of the Royal Canadian Air Force. The topographical data is manifestly not complete, but includes all available that can be adequately shown on the scale used. The newness of the information portrayed is evidenced by the many water areas of considerable size which are as yet unnamed. These strip maps may be considered as forerunners of others to come of Canada's northland which will eventually give way to the sectional type of air map as aerial travel in all directions becomes more general.

Henlys' Free Flying Scheme

THE Aviation Department of Henlys, Ltd., announce that they have completed a scheme whereby everyone who buys a new or second-hand aircraft from them will be taught to fly free. The teaching is exceptionally thorough in that it includes eight hours dual instruction from the Airwork School Instructors at Heston, an hour's

"cramming" in the elements of navigation at the Ferguson School of Navigation and instruction by Henlys' staff in the care and maintenance of the aircraft purchased. Insurance, which it might be thought would prove a stumbling block, presents no difficulties. The purchaser can take out a year's policy at the same premium as if he had already had his "A" Licence, the greater risk of his early solo days being met by a small and temporary increase in the "excess." Apart from the fact that the scheme will save the purchaser about £50—the sum his training at a school would probably cost him—it must necessarily prove extremely attractive to the novice, in that he learns to fly in the same machine as he will later own, and can become thoroughly accustomed to any idiosyncrasies from the start.

No. 3 Squadron R.F.C. and No. 3 (F) Squadron Annual Re-union Dinner

THE Twelfth Annual Officer's Re-union Dinner of No. 3 Squadron will take place on Friday, December 4, at The Mayfair Hotel, at 7.30 p.m. Tickets will be 12s. 6d. each, exclusive of wines and may be had on application to the Honorary Secretary. Owing to overseas postings and changes of addresses it has been impossible to send notices of the Dinner to all Members on the books. Will any ex-Member of the Squadron who has not received a notice please communicate with the Honorary Secretary, Flt. Lt. J. Oliver, A.F.C., No. 3 (F) Squadron, Royal Air Force, Upavon, Nr. Marlborough, Wilts.

34 Squadron, R.F.C. and R.A.F. Re-union Dinner

ALL ranks wishing to attend the above in February, 1932, please communicate with the Hon. Sec., K. Munro, Henlow Camp, Beds. Place, date, etc., will be announced later.



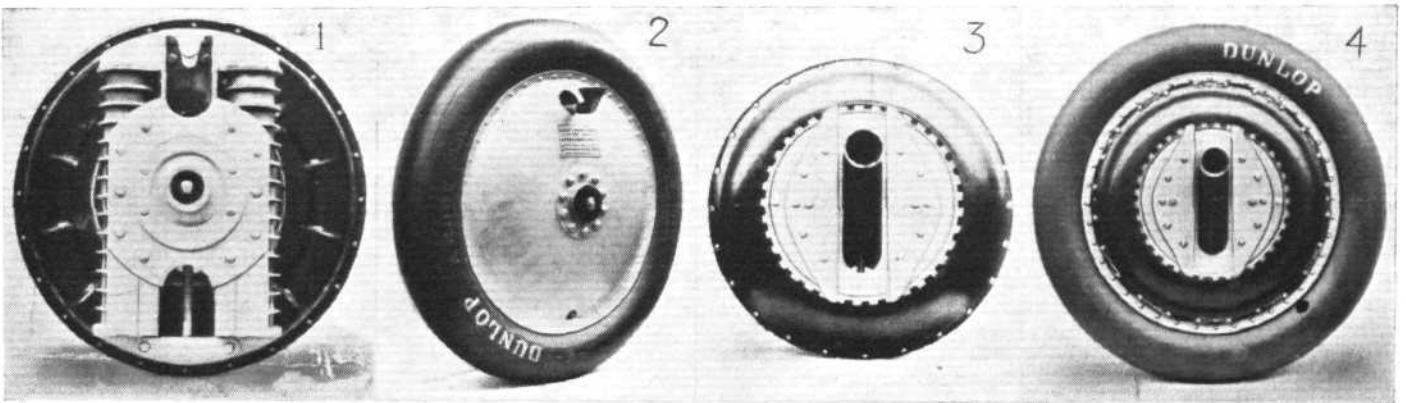
AN AMERICAN BOMBER: Two views of the second of the new Boeing all-metal, low-wing monoplane bomber, seven of which have been ordered by the U.S. Army Air Corps. With a wing-span of seventy-six feet and powered with two "Hornet" engines, the bomber carries a crew of five and can transport two 1,000-pound bombs. Performance figures are not released, but it is claimed that the bomber is substantially faster than any present type of bombing plane. It has retractable landing wheels.

Internally-Sprung Wheels

Mr. G. H. Dowty has for several years made a special study of aircraft undercarriages and aero wheels. In THE AIRCRAFT ENGINEER (Monthly Technical Supplement to FLIGHT) we have published articles by Mr. Dowty on these subjects, and the following notes describe a new type of internally-sprung wheel designed by Mr. Dowty and now being put on the market by his firm: The Aircraft Components Company

OF the many components which go to the making of a complete aircraft, the undercarriage is, perhaps, the most irritating unit. It is used for but a few seconds during take-off and landing, and for the rest it is a "passenger," contributing nothing to the lift, but a great deal to the drag of the machine, not to mention a quite considerable percentage of weight. Undercarriages have, it is true, been refined a certain amount of recent years, but even the fitting of "spats" and the careful fairing of

The main features of the Dowty internally-sprung wheel may be seen in the photographs. Fig. 1 is an external view, and shows that a sturdy webbed Elektron casting houses the brake drum and main bearing. In this particular arrangement the shock absorber dashpot is centrally disposed, and operates in conjunction with two columns of compression rubbers. A type of wheel now under construction employs steel springs in place of the rubbers. The dashpot is double-acting, and there is a powerful check to spring recoil. The tyre, rim and side discs move



joints of undercarriage legs to fuselage and/or wings have not succeeded in doing more than improving slightly the adverse effects of the presence on the machine of the undercarriage unit. The retractable undercarriage has occupied the thoughts of designers for many years, but little real progress has been made. The extra complication and weight which are introduced by the retractable undercarriage have generally been such as to make its adoption of doubtful value. This is largely due to the presence in the undercarriage unit of the telescopic shock absorber leg, the attachment of which to fuselage or wing complicates any folding or retracting arrangement. The Dowty internally-sprung wheel affords a solution to many of these difficulties, and even in a non-retracting undercarriage the wheel has very considerable aerodynamic advantages in that it reduces the interference drag usually present between undercarriage and fuselage, and between wheel and strut. The pocket formed between the side of the wheel and the tyre and shock absorber strut is all but eliminated.

The weight of the Dowty internally-sprung wheel is smaller than the weight of an ordinary wheel plus its shock-absorber strut and brake, and the cost of the wheel is not greatly in excess of the components which it replaces.

From a maintenance point of view also, the Dowty wheel would appear to have advantages. In the orthodox type of undercarriage it is necessary, when adjusting or overhauling the shock absorber strut, to sling the complete machine, or to rest it on trestles. With the Dowty type of internally-sprung wheel, the complete shock absorber system and brakes can be removed by jacking the wheel axle and pulling out a single bolt.

Finally, it may be said that the Dowty internally-sprung wheel has been thoroughly tested at the Royal Aircraft Establishment at Farnborough, and that during the tests it carried twice the maximum load demanded without failure.

vertically against spring action, and the movement takes place about a central nickel-chrome forging running in four bronze slides. The main crossheads and slides are aluminium castings, and the side member, which carries the small hub, is machined from a duralumin forging. The large hub through which the stub axle passes is machined from a steel forging. This hub has a flange to which the brake carrier plate is rigidly bolted. The outer hub and central retaining bolt for the axle cap can be seen in Fig. 1. The total vertical travel for a 30 x 5 wheel is more than 6 in., and the energy absorption is approximately 4,000 ft./lb.

Fig. 2 is an external view, and shows the filling funnel used for maintaining the oil level in the dashpot. The funnel is vented to prevent air locks forming during filling. When the funnel is unscrewed, the excess oil drains away when the funnel is inverted. The flush-type axle cap is one of the many distinctive features of this wheel.

In Fig. 3 the wheel is shown with the Palmer brake unit in position. The plates mounted on the brake backing plates transmit the torque to the undercarriage structure. The air valve which connects with the brake pressure chamber can be seen on the left side. Two Tecalemit nipples which pass through the torque plates lubricate the main bearings.

Fig. 4 is another external view, and in this case the complete assembly is mounted in the wheel, ready for attachment to the undercarriage. The wheel, it will be seen, is of very clean contour.

Aircraft Components Company have a number of wheels completed ready for delivery, and others are coming along. For further particulars application should be made to Aircraft Components Company, either at Grosvenor Place South, Cheltenham (phone Cheltenham 3755), or to the London office at 4, Lloyd's Avenue, London, E.C.3 (phone Royal 4595).



VIBRATIONS

A Miniature Portable Universal 3-Component Vibration Meter

ALTHOUGH primarily intended to give a chart record of the vibration and shocks occurring on locomotives and rolling stock, this instrument, which has been produced by Trüb, Täuber & Co., of Zürich, Switzerland, and is handled in Great Britain by the Anglo-Swiss Electrical Co., Ltd., of 15, Victoria Street, London, S.W.1, should also find its uses in aircraft and aero engine work. The instrument can be adjusted to record to any desired scale from full size to twice full size.

The Trüb, Täuber & Co. vibration meter consists of three independent miniature seismographs, each of which records one of the three components. When the instrument is suitably placed, one horizontal component records the vibration in a longitudinal direction, i.e., along the longitudinal axis of the vehicle or aircraft, and the other records vibrations at right angles to the longitudinal axis. From the records of the vibrations in the three planes at right angles it is possible to determine the movement as a whole of the spot where the vibration meter is mounted.

Referring to the accompanying illustrations, the weight (14) for the vertical component is mounted on one end of an arm (15), the other end of which is free to move about a horizontal pivot. The arm is carried by a spring (16). Attached to the front end of the arm (15) is a second arm, which projects downwards and terminates in a disc working in an oil dashpot (17), which effectively damps the

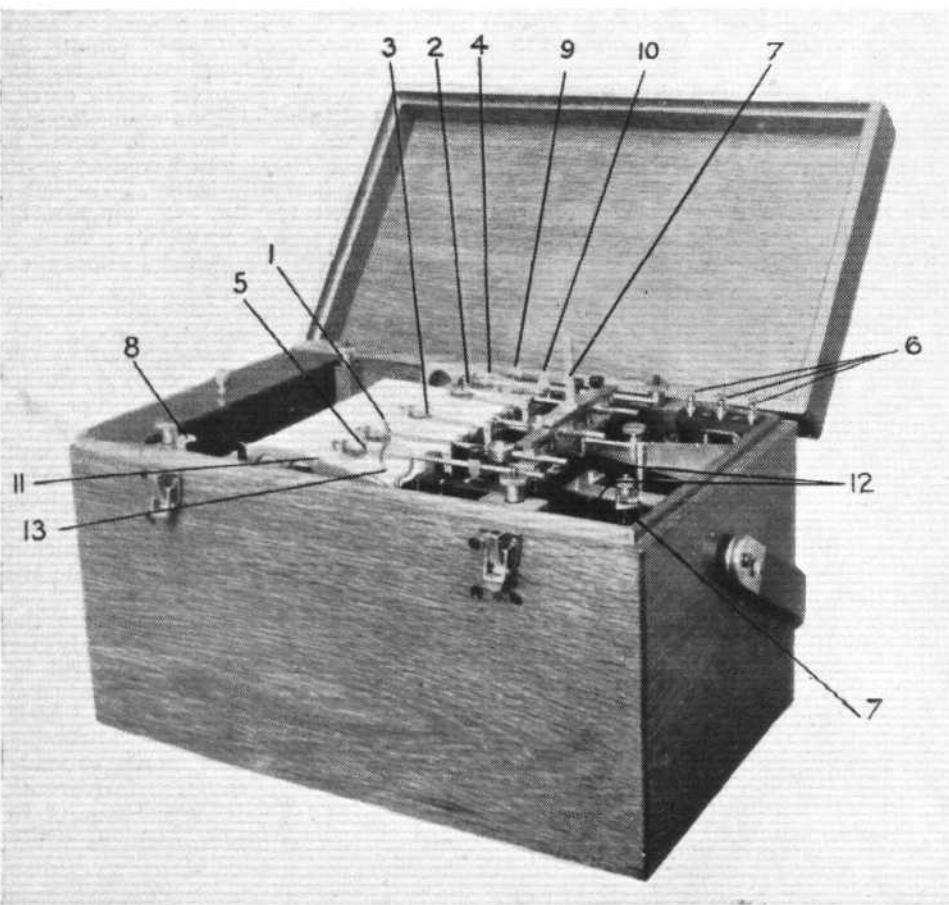
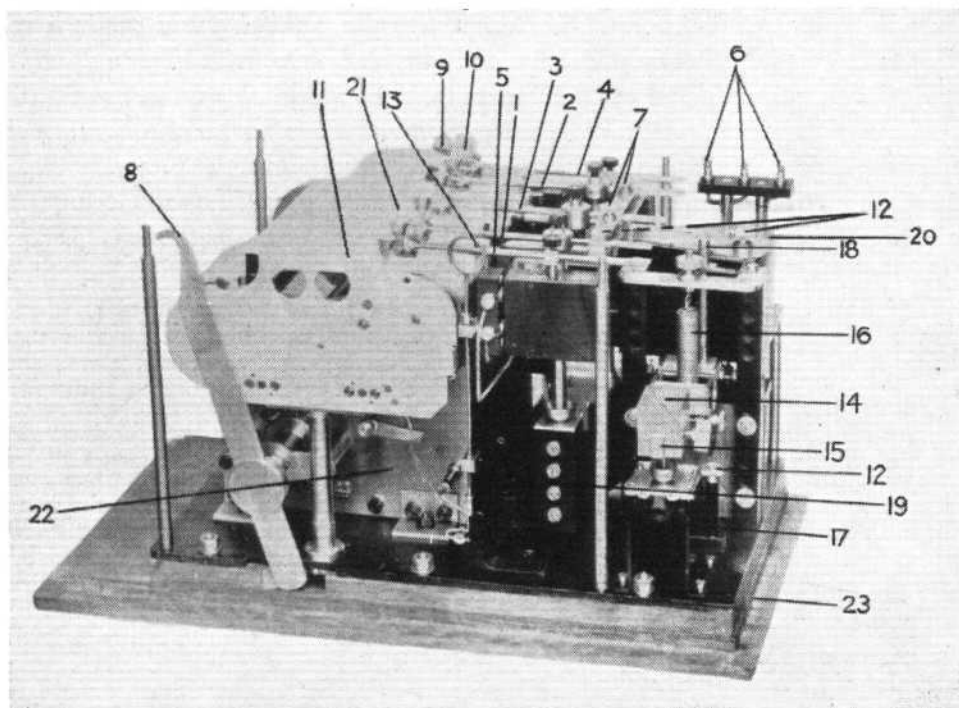
natural oscillations of the weight. The vertical movements of the weight (14) are transmitted to the pen arm (3) by a simple system of levers (18).

For each of the two horizontal components the inactive weight is mounted on the vertical edge of a thin rectangular plate, which is hinged like a door about the other vertical edges. Each of the two plates is completely enclosed in a box filled with oil (19 and 20) for damping purposes. The movements of these two plates are transmitted to the pen arms (1 and 2) in the same way as for the vertical component.

The outstanding feature of the instrument is the powerful air and oil damping of the components, combined with very low friction. By virtue of the special damping, it is possible with this instrument to obtain a faithful record of the most severe shocks without any danger of resonance. At the same time, owing to the small amount of friction present, the instrument will record accurately vibrations of relatively small amplitude, and each of the pen arms has a well-defined zero position.

In addition to the three pen arms which record the three components, two further pen arms are provided. These arms (4 and 5) are actuated by small solenoids, and are intended for drawing time lines on the chart. The arms (4 and 5) can be controlled either by a contact chronometer or by hand key, and the leads from the two solenoids are brought out to the terminals (6). Neither chronometer nor hand key is normally supplied with the instrument, but a $4\frac{1}{2}$ -volt dry battery is mounted in the case for energising the solenoids.

All five pens record in ink on a common chart (21), the effective width of which is 150 mm. (1 31/32 in.). The chart is



driven by a clock (22), the latter being wound by means of a ratchet lever (8). Two ranges of chart speed are provided, the first being from 70 mm. to 300 mm. ($2\frac{3}{4}$ in. to 11 $\frac{13}{16}$ in.) per min., and the second from 140 mm. to 600 mm. ($5\frac{1}{2}$ in. to $23\frac{5}{8}$ in.) per min.

When the instrument is used with a high chart speed, the ink has not sufficient time to dry, and therefore a

plaster roller is fitted, which automatically dries the chart and prevents smearing.

The complete instrument is contained in a portable oak case, fitted with leather carrying strap and measuring 440 by 250 by 260 mm. ($17\frac{1}{2}$ in. by 10 in. by $10\frac{1}{4}$ in.).

Further particulars from the Anglo-Swiss Electrical Co., Ltd., 15, Victoria Street, London, S.W.1.



Airport News



CROYDON

INSTRUCTIONAL flying and joy-riding seem to have passed all records lately; in fact, it is a common sight to see six or seven instructional machines in the air at once. The British public certainly seem to be getting air-minded at last, and joy-riding after dark is very popular here, especially on Saturdays and Sundays.

Gales interfered with the services a little on Wednesday, and some of them had to be cancelled. The Air Union managed to get several machines through, and the morning services of Imperial Airways from Paris reached Croydon. Few passengers suffered any discomfort, however, and many expressed their satisfaction with the airway. I rather gathered that the Channel was very choppy and uninviting.

On Thursday, great excitement was created among the staff of the Aerodrome, when Mr. John Gilbert, the film star, accompanied by Miss Lupez Vallé, left for Paris by a special machine. The poor man was besieged for his autograph, any scrap of paper being utilised for the purpose.

The "Focke Wulf" passed over here on its way to Tamworth. As this extraordinary machine approached

the aerodrome, it appeared to be flying tail first. We all hoped it would land, so that we could have a close view of it, but we were disappointed. [See p. 1137.—ED.]

Imperial Airways hope to send the first of the Handley Page 42 type out East next week. These machines have done good service this summer, and have been carrying full loads. [NOTE.—As reported on p. 1135, this machine left for the East on November 9.—ED.]

Things are very slow over on the manufacturing side of the Aerodrome. Messrs. Desoutter are building a few machines, as also are Redwings. Mr. Russell has taken up his abode at Colchester, and Mr. Payne at Salisbury, where they have just sold a machine to the local Wiltshire Light Aeroplane Club.

Cirrus Hermes Engines continue to sell their product to many aircraft manufacturers abroad. This is also the time of the year when wise private owners have their engines overhauled. I hear that Surrey Flying Services and Rollason people are full up at the moment with C. of A. overhauls.

The traffic figures for the week were:—Passengers, 796; freight, 74 tons. P. B.

A "COMMERCIAL" SWIFT?

AT a time when the daily Press is busy writing headlines about the flight to Australia in the world's smallest baby plane, it may seem a little astonishing to be told that this little machine is capable of being used not merely as a private owner's machine but as a "commercial" aircraft. Mr. Butler's flight to Australia has demonstrated conclusively that the "Swift" with Pobjoy "R" engine is something very much more than the toy many people had imagined it to be, and that it is capable, even when heavily loaded, of hard driving and of getting out of and into none-too-large landing fields. The claims to consideration by the owner-pilot are irrefutable after this proof of its abilities.

It is obvious at the start that the Comper "Swift" could never be used with advantage for carrying bulky loads. But what about mails? When carrying fuel and oil for a range of 392 miles (632 km.) at a cruising speed of 112 m.p.h. (180 km./h.), the "Swift" has a disposable load of 255 lb. (116 kg.).

It is, we believe, customary to take for air mails 89,600 letters to a ton weight. This is equivalent to 40 letters per pound weight, or 0.4 oz. per letter. Taking this figure for the "Swift," the number of letters that could be carried would be $40 \times 255 = 10,200$ letters. Even without taking into consideration the low average weight of air mails, and taking each letter as weighing the usual $1\frac{1}{2}$ oz., the "Swift" would still carry some 2,700 letters.

The Comper Aircraft Company have worked out the following items of operating cost, basing them on a petrol consumption of $4\frac{1}{2}$ gall. per hr. and an oil consumption of 0.187 gall. per hr.: Cost per hr. of No. 1 petrol at 1s. 2d. per gall., 59.9d. Cost per hr. of No. 1 oil at 4s. per gall., 9d. Petrol cost of transporting 255 lb. of mails one mile, 0.494d. Oil cost of transporting 255 lb. of mails one mile, 0.08d. Maintenance of airframe and engine, including top overhaul, complete overhaul and replacement of worn parts over a period of 400 hr., per mile, 0.25d. Total cost of transporting 255 lb., 0.824d. per mile, or, put in another way, 7.25d. per ton-mile.

To these should, of course, be added such items as pilot's salary, insurance, depreciation, etc., which would bring the cost up very considerably. Even so, it is conceivable that on a certain number of routes, where the amount of mail is small, the "Swift" might be operated at a profit. In outlying country districts in some of the overseas portions of the British Empire the "Swift" would probably prove the cheapest type for air mails produced hitherto, since the running costs, other than pilot's salary, are so extremely low. A contemporary, until it changed its views, was fond of regarding air line pilots as the equivalent of bus drivers. Perhaps the comparison should have been made with postmen. With a pilot drawing a postman's salary the "Swift" would certainly be a paying proposition as a mailplane.

Hendon History

THE Libraries Committee of the Hendon Urban District Council have decided to assemble a collection of material referring to the connection of Hendon with the early history of aviation, to form part of the Local Collection in the Reference Library, where it will be permanently preserved and made available for public reference. Many of the items to be collected are of a fugitive nature, such as programmes of early aviation meetings, handbills, etc.,

and therefore likely to be lost or destroyed. In view of the historical value of such documents the Committee realise the importance of their being placed in proper custody in some safe central repository, and have therefore decided to issue an appeal to owners of aeronautical literature for gifts that will help to make a representative collection. Gifts should be sent to the Chief Librarian, the Central Library, The Burroughs, Hendon, N.W.4., who will acknowledge them in due course.

Private Flying & Club News



CINQUE PORTS FLYING CLUB.—Reduced daylight hours brought down the total flying time for the week ending November 1 to 10 hr. 5 min. The weather generally has been very kind, making up to some extent for the alleged summer of this year.

Suppressed excitement has prevailed during the week, consequent upon the departure of two expeditions—Miss Salaman and Mr. Store to the Cape, and Mr. Butler to Australia. At the time of writing they are all making excellent progress, and the promise of two broken records seems not unlikely.

This week the Club bade farewell to Mr. Morris, of Cranbrook, who, it will be remembered, won the Tatler Scholarship. He is leaving to take up an appointment in Norwich, and will take with him the best wishes of all the members.

On Friday the Club received a visit from Major Travers, of the London Aeroplane Club, who was at one time instructor here, and on Sunday Capt. H. D. Davis, of Brooklands Aviation, Ltd., paid a visit, as also did Mr. Brian Allen, of Henlys, Ltd., in a smart Sports "Avian."

On Saturday a visit was paid to Brooklands Aerodrome by the Chairman, Maj. Krabbe, Mr. A. Dallas Brett, and Mr. Twaites, where they inspected the palatial new clubhouse, repair shops, etc., and were entertained to tea by the Brooklands Club.

A NAVAL FLYING CLUB.—A club for the provision of flying facilities for naval officers has now been formed. This is called The Royal Naval Flying Club. Its London headquarters will be at Hanworth Park, and facilities for flying have been arranged for its members at Hamble and all the N.F.S. provincial clubs. Similar arrangements are being made with authorities at the other home ports, namely, Chatham and Plymouth, and before long it is hoped that it will be possible for the members to fly at several places abroad. Membership of the club is confined to those who hold or have held permanent commissions in the Royal Navy and the Royal Marines and subordinate officers on the active list. The subscription, which covers the facilities at all these places, is £1 10s. per year, with an entrance fee of 10s.

There are already clubs catering for most categories of people who fly, but so far no effort has been made to bring all those Naval officers who do so under one "flag." This club should help to draw the attention of the public to the fact that Naval officers do fly, and that

the Fleet Air Arm is a very live branch of the Senior Service. Further particulars may be obtained from the Hon. Sec., R.N.F.C., Hanworth Park, Feltham, Middlesex.

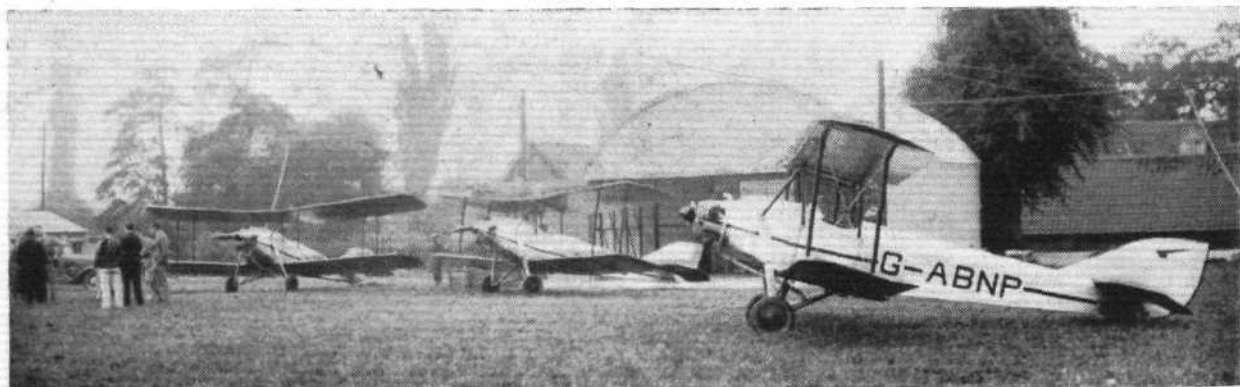
THE PHILLIPS AND POWIS SCHOOL OF FLYING have for some time been contemplating the possibilities of offering a course in blind flying. A machine has now been equipped for this purpose. The Turn Indicator chosen, after a considerable number had been discarded, was the P.B. Deviator.

A particularly neat quick release hood has also been designed, and it has been decided to cover this with canvas, so as to admit a certain amount of light, thereby reproducing natural conditions far more nearly than is the case when an opaque covering is used necessitating the use of electric light. The proposed charge for a course of blind flying during the winter months will be £3 per flying hour. Mr. R. O. Symon, who joined the School on October 19 as an *ab initio* pupil, completed all his tests together with three hours' solo by October 23, thus obtaining his licence in exactly five days.

THE NORTH STAFFORDSHIRE AERO CLUB.—The new club which has been started at Meir aerodrome, Stoke-on-Trent, has been called the North Staffordshire Aero Club, and is being run as another provincial centre by N.F.S., Ltd. Mr. E. B. Bartlett is the club instructor, and he will be remembered as having been some time chief instructor of the Bristol Aeroplane Club.

THE HULL AERO CLUB.—The second annual dance of the Hull Aero Club was held at the City Hall on Friday, October 30, and proved a conspicuous success. Those present thoroughly enjoyed the music provided by the Brooks Band and voted the affair one of the best in the district.

THE NORTHAMPTONSHIRE AERO CLUB held their annual dance at Northampton on Friday, October 30, at the Salon de Danse. As usual, this function was one of the best of the season. The hall was not too crowded for comfort, nor was it depressingly empty. The arrangements were of the best, while the orchestra excelled itself in pleasing the dancers. Possibly we are somewhat antediluvian, but we cannot help feeling that the modern dance tunes do not have the swing in them that they used to do; but no doubt the orchestra was doing the fashionable thing in playing what it did, and it certainly satisfied most people.



COLCHESTER: The Blue Barns Aerodrome at Colchester is now the sales depot of the Redwing Aircraft Co., Ltd., for all territory north of London. Here is shown a group of Redwings when the depot was opened by Flt.-Lt. Russell.

Here We Are Again!

MR. PUNCH'S Almanack for 1932 is with us—heralding that, either the winter we have had this summer is over, or the summer we are going to have this winter is approaching. As before, there are many delightful illustrations, both in black and white and in colour, within its covers, while the text, judging from the one or two

samples we have been able, so far, to peruse, is well up to the usual standard. A look through *Punch Almanack* always serves as a refreshing relief from the tiring humdrum of business occupation—and the current issue is especially so in our case, for so far we have not noticed a single reference to aircraft! A real change of "air" for us, in fact! Its price, as before, is but one shilling.



Air Transport



The Sikorsky S.40 Amphibian

GENERAL arrangement drawings of the Sikorsky S.40 amphibian, which has recently made successful trial flights in America, are shown in the accompanying illustration. As previously recorded in FLIGHT, Pan American Airways, which operates the passenger and mail air services between the United States and Central and South America, has been making an exhaustive study of means of connecting with Imperial Airways' European services by way of Bermuda and the Azores. Although Pan American Airways have had considerable experience during the past four years with comparatively long over-water air routes, their equipment has been limited to machines of a gross weight of 7 or 8 tons with a cruising range of about 500 miles. This has not, however, enabled a comparison to be made with longer ranges, such as across the Atlantic or as on the England-India and England-Africa routes of Imperial Airways. Therefore, while present schedules do not yet afford sufficient passenger volume to justify the purchase of machines of a comparable size, it was considered that the coming requirements for long over-water flights with heavy loads justified ordering two experimental machines of a size far beyond any which had hitherto been designed and built in the United States.

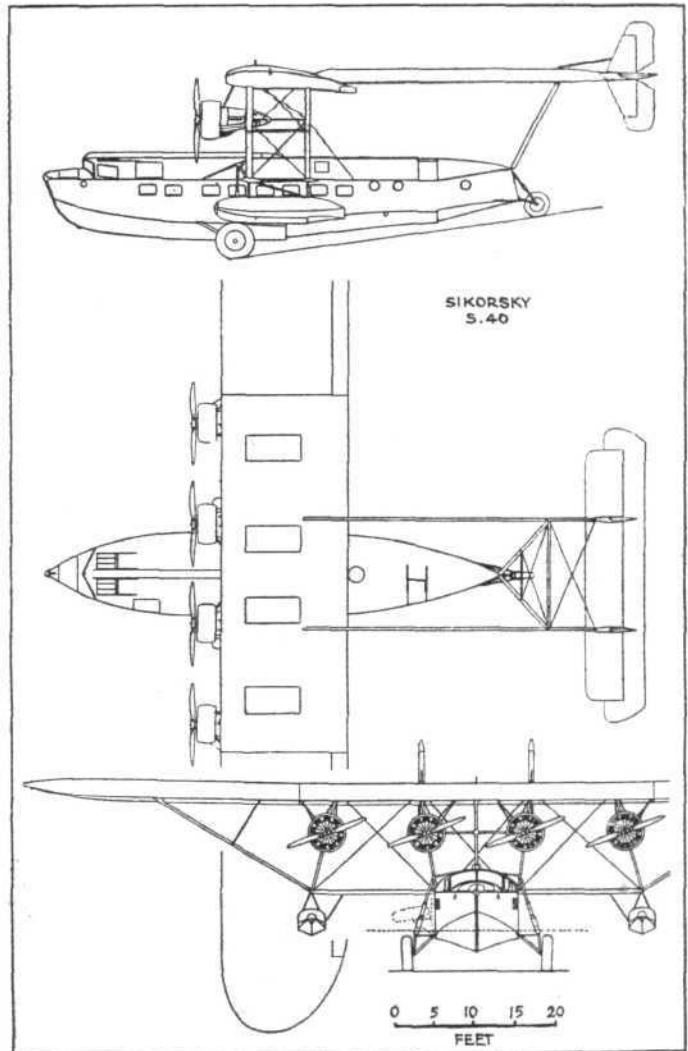
An order was therefore placed with the Sikorsky Aircraft Corporation for two four-engined amphibians of 17 tons gross weight, and the S.40 under review is the result. It is not intended to use these machines for Transatlantic service, but they will be put into commission on the 1,300-mile over-water route between North and South America, where their performance will be studied very closely with regard to development for the longer trans-oceanic flights.

The Sikorsky S.40 is a high-wing monoplane not unlike the smaller well-known Sikorsky S.38 and S.41 amphibians, that is, of the "short" hull type with the tail surfaces carried on outriggers from the main plane. It is powered with four 575-h.p. Pratt & Whitney direct-drive "Hornet" engines mounted below and forward of the leading edge. The single vee-bottom hull, carrying 40 passengers and crew, is of all-metal construction, incorporating extruded duralumin shapes and Alclad sheets, assembled with dural rivets.

A pair of outboard floats, strut-braced to hull and wings, aid stability on the water. Fully retracting landing wheels, and a tail wheel, are provided, but the machine can be flown as a flying boat with considerable improvement in performance.

The wing frame is built up of extruded duralumin sections, and formed dural sheet with a certain amount of steel plates at various fittings. The entire frame is covered with fabric with the exception of a metal skinned portion of the centre section over the engine nacelles.

During test flights with full load the machine attained a top speed of over 130 m.p.h., a cruising speed of 110-115 m.p.h., and landed at approximately 65 m.p.h. A rate of climb of 712 ft./min. was obtained, and an absolute ceiling of 13,500 ft. is anticipated. With full load and three engines running a ceiling of 6,500 ft. has been



The Sikorsky S.40 Amphibian (four 575 h.p. Pratt and Whitney "Hornet" engines).

attained, and level flight at 2,000 ft. has been maintained on two engines with a gross load of 29,000 lb. With a gross load of 34,000 lb. the S.40 attained an altitude of 5,250 ft. in ten minutes.

The principal characteristics of the Sikorsky S.40 are:—Span, 114 ft.; overall length, 76 ft. 9 in.; wing area, 1,868 sq. ft.; gross weight, 34,000 lb.; weight empty, 21,500 lb.; useful load, 21,500 lb.; wing loading, 18.2 lb./sq. ft.; power loading, 14.8 lb./h.p.; speed range, 65-130 m.p.h.; range (40 passengers), 500 miles; (20 passengers), 950 miles.

THE FIRST H.P.42 LEAVES FOR THE EAST

THE *Horsa*, the first of the H.P. 42 Eastern type, left for the East on Monday, November 9. The flight out will in no way be a hurried or record one, but ample time will be spent at each stopping place to ensure that prospective passengers are familiar with the type of aircraft of which it is hoped they will shortly be making great use. If they are as keen on being comfortable as we are, they will certainly do so.

The route will lie through Paris, Lyons, Marseilles, Pisa, Rome, Naples, Catania, Malta, Tripoli, Sirte, Marsa

Matruh and-so to Heliopolis. This flight is expected to take about seven days.

The crew will consist of Messrs. E. S. Alcock, Commander; G. M. Randall, First Officer; S. Oldfield, Inspector; A. Paterson, Flight Engineer; F. Ellis, Wireless Engineer.

The following will be carried as passengers:—Maj. H. G. Brackley, Air Superintendent of Imperial Airways; Lt. Col. H. W. S. Outram, Director of Aeronautical Inspection; and Air Commodore A. G. Board.

On Saturday, November 7, Mr. Handley Page, by way of celebrating this occasion, gave a small luncheon party at the Aerodrome Hotel, Croydon. In a short speech he bid God-speed to the crew, the passengers and the aircraft, and asked those present to drink the health of them all, coupled with the name of Mr. Woods Humphreys, Managing Director of Imperial Airways.

Mr. Alcock replied for the crew and stressed the importance of comfort in machines flying on the Eastern route.

Mr. T. England, of Handley Page, Ltd., proposed the health of the guests, and asked the Director of Civil Aviation to reply for them. Lt. Col. F. C. Sheldermine, D.C.A., then made an excellent and informative speech,

showing that his knowledge of flying in the East is very considerable. He agreed with Mr. Alcock on the necessity for adequate comfort in the machines operating on this route, and said that while a bar was certainly a necessity it was quite useless unless it was provided with some form of ice box. He paid great tribute to the pilots and staff who operate the service out there under exceedingly bad weather conditions in many cases, and sketched its history from the days when the R.A.F. quite literally ploughed the first furrow across the desert.

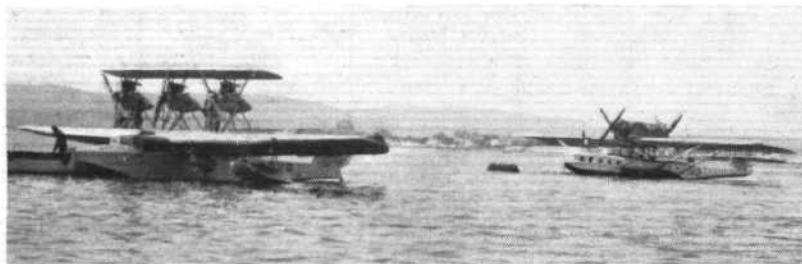
It is interesting to note that on the trip out there the *Horsa* will be loaded to full load with stores and equipment of which latter she will carry some 1,750 lb.

Europe to Africa

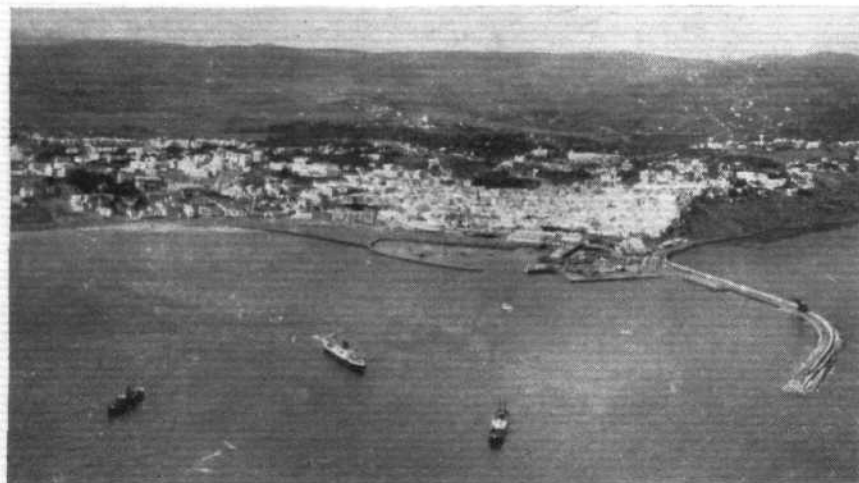
IN FLIGHT for October 23 we announced the formation of Gibraltar Airways, Ltd., to run an air service between Gibraltar and Tangier with Saro Windhoovers. Capt. E. W. Percival, who took out the first aircraft, has now returned, having turned over to Mr. J. D. Wilson, who will carry on as pilot in charge of the service. Capt. Percival tells us that he expects this line to be a great success, for during the five weeks he was there he made an average of three return trips every day. Landing is not possible in Tangier harbour when the "Levanter" is blowing strongly, and on these occasions the passengers are taken on to the aerodrome a little way inland, such is the advantage of having amphibian aircraft. Already the promoters are finding an increasing demand for the service as the saving over the boat journey is very considerable. Capt. Percival's arrival at Gibraltar was made an occasion for



THE START. A view of the "Rock" seen from the "Windhover," taken on one of its first journeys to Tangier.



THE MEANS. The Saro "Windhover" (three Gipsy II's) at anchor in Gibraltar harbour. Beyond her is a Dornier "Wal" which operates on the line Gibraltar to Genoa, meeting the New York mail boat on her outward trip and then remaining at Gibraltar until the incoming ship arrives.



THE END. Looking down at Tangier harbour from the "Windhover" on her first trip. It will be seen that the harbour is somewhat open to easterly winds and therefore when this area is too rough the "Windhover" lands at the aerodrome, which is just over the hills.

much jubilation, and we gather that he had to participate in many functions organised for his benefit, not the least romantic of which were picnics to the Cork Woods—well known to every junior Naval officer!

Air Mail Leaflet, Winter Edition

THE Postmaster-General announces that the winter edition of the Air Mail leaflet, which gives particulars of the winter air mail services available for correspondence posted in this country has now been issued. Copies of the new leaflet are being sent to regular users of the service and can also be obtained free of charge at any Post Office. Regular users of the air mail services are advised to consult the new leaflet regarding the services in which they are interested as a number of changes have been made in consequence of alterations in the timing of the air services. Particular attention is drawn to the fact that the England-British East Africa air mail service now leaves London on Wednesdays, the latest time for posting in the air mail letter box outside the General Post Office, London, being

11.0 a.m. on Wednesdays. The England-India air mail service still leaves London on Saturdays, the latest time for posting in the air mail letter box outside the General Post Office, London, being 11.0 a.m. on Saturdays.

A Nigerian Air Service

A NEW weekly air mail service between Lagos (Southern Nigeria) and the Cameroons started on November 6, when the Aircraft Development Company's seaplane left Lagos for Warri, Port Harcourt, Calabar and Victoria, carrying the first official air mail in Nigeria. The service is experimental, but it is hoped ultimately to provide a service connecting regularly with mailboats at Lagos.

U.S. Airliner Crashes

A REGULAR transport aeroplane of the Ludington Line, which was bound from Newark to Washington, crashed on November 5 as it was about to make a landing at Camden, New Jersey, and burst into flames. All four of its passengers and the pilot were instantly killed. The cause of the accident is unknown.

Focke-Wulf

"Ente"

AS it was illustrated and described in detail in *FLIGHT* of January 2, 1931, there is little need to enter into a discussion here of the features of the Focke-Wulf "Ente" or "tail-first" machine which is at present visiting England. It will suffice if we recall that the idea underlying the design is a wing arrangement which precludes spinning, because the small leading plane is so designed, placed and loaded that it will stall before the main wing, thereby bringing the nose of the machine down and preventing the main wing from reaching stalling angle.

The forward wing is of triangular plan form, and the elevator is so hinged to it as to leave a slot between them. This slot is not of the Handley Page type, which varies in size in accordance with the angular setting of the flaps, but remains sensibly constant in size, no matter at what angle the elevators are placed.

We had the opportunity on Saturday last of making a flight in the "Ente," with Herr Cornelius H. Edzard as pilot, and a few impressions of the flight may be of interest.

The tiny cabin has seats for two passengers, side by side, and in the forward wall, near the starboard side, there is a small window communicating with the pilot's cockpit. On this occasion we had hoped to be in the right-hand seat so as to be able to watch the control movements made by Herr Edzard during the various manoeuvres. Unfortunately this was not possible, and so the impressions of the flight are not nearly as conclusive as they might otherwise have been.

As in other cabin machines, one's view forward is not very good, neither is it possible to see the ailerons and so get an idea of the amount of lateral control



used. The engines cut off the view. The take-off is somewhat emotioning, as the machine climbs in a rather alarming attitude, although the actual flight path followed by the machine is probably not very much above normal. In flight the machine behaves exactly as does any orthodox aircraft, and is capable of all the normal manoeuvres, such as steeply-banked turns. We believe the machine has never been looped, but there is no reason why it should not be capable of looping.

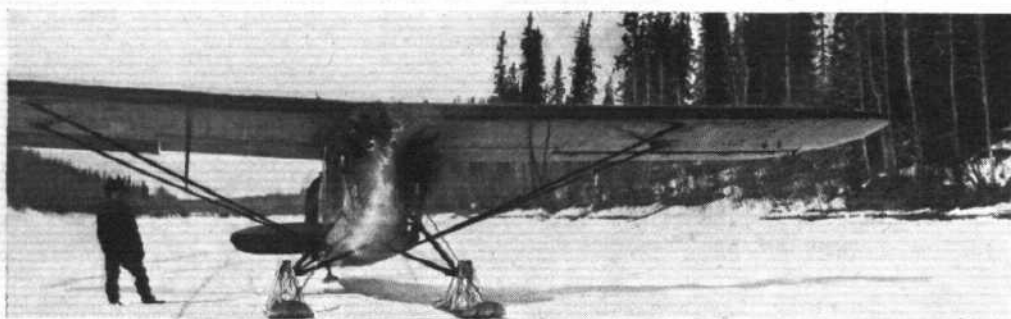
The landing appears to be just what the pilot likes to make it. When the machine is brought in at low speed, i.e., with the nose well up, it is a little strange at first to feel the nose drop suddenly when the main wheels have touched and the pilot applies his wheel brakes.

The one demonstration which we wished to see was not given. This consisted in throttling the engines and gradually pulling the machine up until, at a speed corresponding approximately to the minimum flying speed of the forward wing, the nose dropped. We should very much like to see what sort of attitude the machine then assumes. If it is very steep, the "Ente" is in the position of the normal aircraft which stalls near the ground but does not spin. If the attitude is not very steep, the machine should have a good chance of gliding on to the ground without doing very much damage.

AN OLD IDEA REVIVED: Three views of the Focke-Wulf "Ente" during its visit to Hanworth. In the upper photograph the machine is climbing, but not nearly as steeply as it did on some occasions.

(FLIGHT Photos.)

AN OPENING FOR BRITISH AIRCRAFT



The Fairchild 71A (Wasp) on skis, in use by S.M.A.T.

ON Monday, November 9, Mr. J. W. McDonough delivered a lecture before the R.Ae.S. and the S.B.A.C. at the Gaumont Theatre, Wardour Street, London, entitled: "The Aeroplane as an Aid to Mineral Exploration and the Operation of Aircraft in Sub-Zero Temperatures," which was illustrated with slides and cinematograph film.

This lecture was extremely well attended. Mr. Handley Page, supported by many members of the aircraft trade, was in the chair, and Mr. E. McCleod was present, representing the High Commissioner of Canada.

The lecture was one of the most vital interest to British aircraft manufacturers that it has been our pleasure to hear. Mr. McDonough is over here and wishes to buy a British aircraft to do his own particular job of work, and he cannot get the right machine. His company uses Fairchilds' exclusively at the present, and at least one other company is shortly starting to use a German, Junkers J52; none of them, however, can find a British aircraft which will do what they want under conditions ruling in the Arctic regions.

It will be seen from the report of the lecture which follows that Mr. McDonough, who is managing director of Spence-McDonough Air Transport Ltd., is mainly concerned with transporting geologists, miners and their equipment to the Great Bear Lake district of the North West Territory. The main base of S.M.A.T. is at Waterways, Alberta, and from here aircraft present the only possible solution to the transport problem across the vast barren lands to the Great Bear Lake. It is on the shores of this lake that enormous deposits of urananite, the

radium-bearing ore, have been found, as well as large quantities of silver, copper and other minerals, with the consequence that many of the largest mining companies in the world are starting operations there, and naturally all want transport to the scene of their operations. This the S.M.A.T. are giving them, and so successful has been the management of their firm and its equipment that last year they showed a good profit, and are therefore probably one of the very few unsubsidised aircraft operating companies to do so.

The conditions prevailing in the North are dealt with very fully in the paper, and impose hardships and difficulties on running the aircraft which involve extreme measures and very carefully planned maintenance if they are to be overcome. That they are overcome by this company is shown by the fact that so far the company has had no forced landings at all.

The summer is very short, and during this period they operate the aircraft on floats, returning to skis after the freeze up. During the summer of 1931 the company flew 58,000 miles and carried 41,500 lb. of freight without any trouble whatsoever. During this time also large stores of fuel were cached ready for the coming winter, as several contracts are in hand which should even more establish the company and make it the most important in the North West of Canada . . . the pity of it is that, although they want them, they cannot get British aircraft to do the job!

(The lecture has had to be abridged considerably, but all the essential details have been retained.)

"The Aeroplane as an Aid to Mineral Exploration" and "The Operation of Aircraft in Sub-Zero Temperatures"

"I AM privileged to talk to you on the development of air transportation in the more remote territories of the Dominion of Canada. This considerable development has only been made possible by the constant search for minerals in these regions.

I should like first to explain to you how our Canadian geologists were led to explore such distant regions. The mineralogist and his party must first of all be placed on ground whose formation is associated with the types of mineral he expects to find. The strata of pre-Cambrian era, the oldest known rocks, of which Canada possesses an enormous territory, is the best formation from a mineralogical standpoint. This territory extends in the form of a shield from the N.W. corner of the N.W. Territories to the S.E. corner of the Province of Quebec.

Much of this ground has been prospected for minerals during the latter part of the last century and up to the present time, but owing to the vast areas to be covered and the fact that railway communication only serves a very small section of the suitable areas, very little intensive exploration has as yet been done. Even so, during the past twenty-five years some of the world's largest gold, silver and copper mines have been discovered in the Southern portion of the pre-Cambrian shield.

Early in 1928 a few of Canada's foremost mining men planned an exploration on a scale never before attempted. Hearne's expedition to the Copper-mine River and Coronation Gulf, in the early part of the 18th Century, reported large quantities of copper in use by the natives. This copper, it was felt, must have come from near at hand.

Owing to the very short seasons in the North suitable for mineral exploration, a plan of campaign had to be evolved to provide field staffs with a maximum period for their work. Until recently prospecting parties had been sent into the field by dog team and sled in winter and canoe in summer. This method always took a considerable time and was often accompanied by severe hardships—many weeks and sometimes months of travel being taken before suitable areas could be arrived at.

For overland travel, Canadian seasons are divided into four periods. The first, open water or summer time, which generally lasts two to five months, according to latitude. Secondly, freeze up, which commences September 10 to October 30 according to latitude; and lasts for six weeks, during which no travel is possible. Thirdly, the winter season, November 15 to April 15 according to latitude, during which travel is accomplished by dog team, tractor or aircraft equipped with skis, and lastly the break-up season which commences April 10 to June 20 according to latitude, during which time again no travel is possible. Travel has to be carefully regulated to coincide with these seasonal conditions. This makes it very difficult for the prospector, who naturally wishes to spend as much of his time as possible on suitable ground in the open season, when the snow is absent and rock formations are exposed to view. A system of transport, therefore, which reduces the time of travel to and from the field must be of the greatest value.

Owing to the retreat of the ice sheet which covered Canada some 12,000 years ago, creating a drainage system

throughout Northern Canada containing thousands of lakes, this region is admirably suited for aircraft operation both in winter and summer.

In the spring of 1928, two of the larger exploration companies purchased large fleets of aircraft with a view to covering more ground during the open season and speeding up their activities as well as providing a means of communication between parties in the field and headquarters. No expense was spared in the outfitting of these aircraft units, and every effort was made to obtain the best available for the purpose. Unfortunately, many difficulties were encountered, especially in securing the flight personnel to manage and operate these flying services.

Ordinary procedure was practically worthless, when applied to extreme northern latitudes. Machines had to remain in the open all the year round and in winter servicing had to be performed in temperatures sometimes as severe as 40 deg. below zero. The pilots were faced with an even more difficult task. The country to be flown over was mostly quite uninhabited, maps were practically non-existent, and those available very inaccurate and unreliable. Magnetic compasses could not be relied upon, and the only safe navigating medium was the sun and sextant. Little was known as to the suitability of the aircraft being put into service, although some useful data had been obtained from the Royal Canadian Air Force, who had been operating aircraft on forest patrol and photographic survey under somewhat similar conditions for some time. However, ten aeroplanes belonging to two separate companies set forth on the first open water of 1928, and commenced the largest and best equipped mineral exploration expedition ever to take the field.

First of all petrol and oil caches had to be laid down at strategical points. This was done by the Hudson Bay Co.

and one or two smaller trading concerns who contracted to transport by boat and canoe vast quantities of fuel, and great sums of money were expended in the first year in laying down these supplies.

Owing to the many difficulties experienced and time lost in providing bases and adequate caches, many exploratory flights had to be abandoned, and this first year could only be looked upon as a satisfactory experiment, which provided both the mining and flying staffs with valuable experience. Sufficient knowledge was gained for the management to decide on the most suitable type of aircraft, and the vote was unanimously given to the convertible, semi-high lift, high-wing monoplane, fitted with pontoons in summer and skis in winter. A certain amount of winter flying was performed in the season 1928-29, but it was not until the fall of 1929 that any number of valuable long-distance exploratory flights were accomplished.

In September, 1929, the Dominion explorers' expedition set forth from Baker Lake N.W.T. to fly to the Coppermine River to investigate the rumoured copper deposits. The Federal Government had just thrown open to staking, this area which had been closed for eleven years to prospectors, owing to the hardships and difficulties encountered by the means of travel then available. The flight provided us with much experience of the conditions, but nearly cost the lives of eight men, and all but provided a set-back to mineral exploration by air that would have been felt for many years. The incorrect adjustment of a carburettor and lack of knowledge of weather conditions in the Canadian Barren Lands at that time of year, caused a forced landing on the Arctic coast off Victoria Land and resulted in a search by nearly 40 aeroplanes, costing over £50,000. Fortunately there was no loss of life."

(To be continued)

BOOK REVIEWS

BOOKS NO ONE SHOULD MISS

"*Flying Dutchman. The Life of Anthony Fokker*," by Anthony H. G. Fokker and Bruce Gould. (George Routledge & Sons, Ltd.), price 13s. post free from FLIGHT office.

"*The Bluebird's Flight*," by The Hon. Mrs. Victor Bruce. (Chapman & Hall), price 22s. post free from FLIGHT office.

FEW books can have more in common and yet be so dissimilar as are *The Flying Dutchman* and *The Bluebird's Flight*. They are both stories of achievement told by persons of exceptional character and outstanding tenacity of purpose. Persons who by their every action set an example for all. Never more than to-day have we needed people who are not afraid to "stick to it," for a faint-hearted policy will not, at this time, help aviation forward, and the example of determination, shown in both these books, should give heart to everyone who reads them.

"The Flying Dutchman"

"Tony" Fokker tells you, in frank and open language, the story of his life from the time when he "sat as a boy in my father's attic, furiously flying a kitchen chair rigged up with Wright controls," down to the time, a year or two ago, when he linked up his American interests with the General Motors Corporation.

From the start he was independent and determined to make his own way in life. Paternal authority or that of schoolmasters was, therefore, an irksome restriction, and his escapades when endeavouring to get away from school make excellent reading. Fokker started by inventing a non-puncturable wheel for bicycles and motor cars, and he appears to have achieved quite a measurable amount of success before being let down by an unscrupulous patent agent. He was lucky in having a father with a certain amount of money to spare, for, without constant replenishment of his capital resources, he would never have been able to produce his first aeroplane in the way he did.

His doggedness was, however, repaid when, in spite of many and serious setbacks, he first flew his own aircraft just before Christmas, 1910. Thereafter his history is a tale of pluck and push. It was not until 1913 that he secured the first order for his factory. This was for a mobile unit, consisting of a Fokker monoplane mounted on a lorry in such a way that it could be assembled quickly

after having been transported across country. Fokker's outfit secured this order as the result of a competition, thereby laying the foundation of his German factory.

The story of how Fokker supplied the German Army with aircraft has never before been told in such detail, and, now that it is published, it may be seen that he had far more difficulties to contend with than most people knew. Intrigue and jealousy on the part of the other manufacturers seem to have given him many sleepless nights, but his unorthodox methods and the direct way which he personally tackled every problem always won for him a large share of orders, so that before long the Fokker concern rapidly became the largest in Germany.

In reading this history we learn much of the internal economy of Germany during the war and gain a new insight into the conditions generally.

Typically Fokker is the way in which the Army were forced to take up the synchronised gun gear. Even after being asked to develop this, Fokker found that the ponderous Prussian mind would not accept it right away, and after repeated demonstrations he was forced to don the uniform of a German aviator, though he was still a Hollander, and fly one of his machines over the front to shoot down an allied airman. He actually got his gun trained on an unsuspecting Frenchman before he decided that he would not be forced into such butchery, and he then, as he says, "suddenly decided that the whole job could go to Hell. It was too much like cold meat to suit me. I had no stomach for the whole business, nor any wish to kill Frenchmen for Germans. Let them do their own killing!" So he returned to headquarters, where it was decided that Oswald Boelcke should take the machine out instead. That started the career of that well-known pilot, who eventually formed the first Jagdstaffel, with such pilots as Richthofen, Böhme, Müller and the younger Immelmann.

Fokker is an egotist, and throughout his books we get much evidence of this in the descriptions of his dealings with other people. He is also vain of his own achievements, as may be witnessed by his comparisons between his own and other manufacturers' machines, but neither of these can hardly be called faults in one with such a forceful character, for it was only by the exercise of this very egotism and vanity that he achieved so much.

It is a little surprising that elementary errors should appear in the text. As, for example, referring to some

of our aircraft as BC2Es, or the French aircraft as Morane-Solniers. Again, George Constantinesco would scarcely be pleased to be told that he had simply copied the Fokker gun control gear.

That Fokker himself was no financier is all too amply proven by his financial transactions, for had he been more astute he would have retained a much greater amount of his fortune than he did. The way in which he smuggled out large sums of money as well as 360 railway trucks full of some 200 aircraft and over 400 engines makes a tale worthy of being told separately and will live as an epic but typically Fokker action.

The penultimate chapter is one of the long flights which have been made with Fokker aircraft. We are here treated to the Fokker version of many successful and unsuccessful happenings in connection with some of these flights, and in particular are left in little doubt as to Fokker's dislike for Rear Admiral Byrd. The reason for this is not quite clear, but the fact certainly remains!

The final chapter is called "Footnotes from Experience," and is perhaps, to those of the younger generation who would profit by the story of Fokker's success, the most valuable in the whole book. It is packed with sound maxims, and shows what manner of man is Fokker. To quote a few of his passages:—"The chief reason why I am still of value to-day in the aeronautical industry is because I can make every part of an airplane with my own hands if it should be necessary. . . . Unlike a great many designers, I actually fly my planes, use them as other men use automobiles and yachts. . . . A good designer should be able to tell why every part was made in just that way, for every good airplane is the result of infinite compromise with aeronautic theory. . . . Nothing I have yet done has ever really satisfied me. No one has yet found as many flaws in an airplane of mine as I could find myself. . . . Everybody who has been successful in life could start out at any moment, begin all over again, and in a comparatively short time reach at least the same level. Those who are put on top arbitrarily seldom can stay there if they don't have ability. . . . Many people are too easily satisfied that they have done a good job. They would know if they were more critical that they could do better. . . ."

Fokker finishes with:—" . . . Looking forward to the possibilities of aviation, the dream of my pioneer work becoming the nucleus of a world-wide enterprise should yet be possible through my affiliation with the General Motors Corporation. . . ."

In view of the recent news that the partnership has been broken up, the above passage seems somewhat pathetic, and it is to be hoped that Fokker will succeed in obtaining the financial support he needs and continue his career to greater heights.

The Bluebird's Flight

TURNING to "The Bluebird's Flight," we find an equally praiseworthy book, but one covering a far shorter period. It has become almost proverbial that any pilot making a long flight should write a book about it, with the result that there has been a flood of, in many cases, very indifferent literature. Mr. F. C. Chichester has so far given us one of the few outstanding examples of a readable book with his "Solo to Sydney." Now comes this book of Mrs. Bruce's to compete for first honours.

Mrs. Victor Bruce is already well known for her amazing performances with cars and motor-boats and for feats entailing sheer grit she stands alone. She is known as a woman who always does what she sets out to do and who, in spite of masculine jobs, like her Monthlery drive for ten days and nights with her husband, and this flight in the "Bluebird," yet always retains her charm and femininity.

Her flight round the world was simply amazing, and has hardly received the general acknowledgment it deserved. In comparison with the welcome given to some other pilots, her reception at Croydon on her return was not worthy of the occasion. Her book should, however, discount this and show the flight in its true light, and be the means of her receiving the recognition she so richly merits.

In his foreword, Col. the Master of Sempill stresses the point that Mrs. Victor Bruce does not give adequate credit to her own pluck and skill. This view is fully justified, as throughout the book there is abundant evidence of sound common sense in all her actions and of her aptitude for learning from every mistake. The writer well remembers his first sight of Mrs. Bruce flying. She had only

done some very few hours solo when she came to a certain flying meeting. The aerodrome was somewhat small, and the onlookers were terrified to see Mrs. Bruce overshoot badly. But at just the right time she opened up her engine and avoided hitting the fence by making another circuit. This she repeated three times before finally coming in slowly enough to land perfectly. Many others would either have hit the fence or been too frightened to land at all, but not so Mrs. Bruce; she had never before landed in a small field, but that, as she told me afterwards, was not going to stop her learning at once!

Mrs. Bruce has a literary style all her own, and it reads excellently. Her book is filled with anecdotes and little incidents of her great flight which make it one of the most interesting and instructive and yet, at the same time, amusing books of recent date.

Her whole attitude to life, her grit and determination, her quality for sticking to it (one might say Fokker-like), are all brought out right from the beginning when, as early as page 7, one reads that it was not until *after* having bought her aircraft, organised the flight, obtained weather information and purchased maps that she went to an aerodrome to learn to fly!

The terrifying experiences she went through when she had to make a forced landing some miles from Jask, on the inhospitable coast of the Persian Gulf, were enough to make most people give up the flight altogether. Not only did Mrs. Bruce pacify and completely win over to her side the Baluchi tribesmen, but also some Afridi brigands, of whom the former were much afraid.

The somewhat naïve manner in which Mrs. Bruce tells stories against herself gives the book added charm. For those who have the pleasure of her friendship know that one of her assets is the manner in which she is always ready to laugh when the laugh is against her.

Mrs. Bruce has undoubtedly learnt a great deal about flying now that she has been on this memorable flight, but she is always ready to learn more, a fact which is borne out by the way in which she handles every kind of risk and circumstance. It is little surprising, therefore, that she should fall into a pitfall of the kind we associate with newspaper reporters—in one place she writes:—"As I flew by I was almost forgetting to keep my course, so spellbound was I by the glory of this wonderful mountain; but an *approaching hum* warned me that other aeroplanes were near." It is a pity that she does not mention that she was gliding down with her own engine off and was thus able to hear the Dornier Wal, which she tells me came up from behind and unpleasantly close to her.

Don't miss this book; it's well worth reading.

"DAEDALUS."

HENSON AND STRINGFELLOW.

Henson and Stringfellow, their work in Aeronautics.
By M. J. B. Davy, A.F.R.Ae.S. (The Science Museum.
Published by H.M. Stationery Office. 5s. net.)

TOO little credit has been given to the Somerset engineer, John Stringfellow, and his collaborator, W. S. Henson, for the work which they accomplished in the development of mechanical flight. Both lived at the little town of Chard, and their practical work in aeronautics covered the period 1840-1868. They were both acquainted with the principles of flight by a heavier-than-air machine, possibly through studying the writings of Sir George Cayley, who had undoubtedly mastered those principles on paper. Henson wished, in the popular phrase, to run before he could walk, and filed a specification for an "aerial steam carriage," and formed a company to operate it. The claims made were somewhat flamboyant, and evoked ridicule. Nevertheless, Henson had a sound knowledge of the principles of flight. He left this country for America without having achieved anything practical.

Stringfellow, more modest, accomplished more meritorious work. He actually made a model aeroplane with a tiny steam engine, which flew under its own power. He himself considered the engine the best part of his invention, and he was awarded a prize for it. He seems to have realised, however, that aeroplanes would not be able to lift men into the air until the internal-combustion engine was developed, and in that he was right. Nevertheless, it does seem strange that, after power-driven flight had been proved possible by this model experiment of Stringfellow's, another 50 years were to pass before the human race's age-long ambition should be realised by the brothers Wright.

THE ROYAL AIR FORCE

London Gazette, November 3, 1931.

General Duties Branch

The follg. are granted permanent comms. with effect from October 24, and with seny. of dates stated:—P/O. W. E. Coope (R.A.F.O.) (April 24, 1930); F/O. H. R. A. Edwards (R.A.F.O.) (October 24, 1930); J. M. Freeman (October 24, 1930); P/O. A. L. Holland (R.A.F.O.) (October 24, 1930). The follg. Pilot Officers are promoted to rank of Flying Officer:—G. A. Bolland, L. A. Bullard, E. Dawson, A. E. Dobell, R. B. Harrison, P. Haynes, L. J. M. White (October 11); J. B. B. Cross (October 13).
Ft.-Lt. F. M. Denny ceases to be seconded for service as Aide-de-Camp to the Governor of Victoria (September 26).

Medical Branch

C. H. Smith M.D., C.M., is granted a short service comms. as Flying Officer for three years on active list, with effect from and with seny. of October 2.

ROYAL AIR FORCE RESERVE

General Duties Branch

The follg. Pilot Officers are promoted to rank of Flying Officer:—F. Ingham (September 4); A. C. C. Seligman (September 17); A. J. C. Stuart (September 17); J. O. Hinks (September 20); B. N. H. Thornely (September 20); E. Shipley (September 21); A. W. A. Whitehead (September 24); N. B. Massy (September 24); J. L. H. Fletcher (September 24); J. W. Radbone (September 24); R. C. Tripp (September 25); A. J. S. Negus (September 27); J. A. H. Sargeant (September 28).

The follg. Flying Officers are transferred from Class C to Class A:—F. K. Campbell (September 17); H. A. Denny (September 7); V. G. H. Gee (September 29). Ft. Lt. S. L. H. Potter is transferred from Class A to Class C (July 14); F/O. F. W. Moncrieff is transferred from Class AA (ii) to Class C (October 31).

The follg. relinquish their comms. on appointment to permanent comms. in R.A.F. (October 24):—F/O. H. R. A. Edwards, P/O. W. E. Coope, P/O. A. L. Holland.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Wing Commander V. Gaskell-Blackburn, D.S.C., A.F.C., to No. 1 Armoured Car Co., Hinaidi, Iraq, pending taking over command, 16.10.31.

Squadron Leaders: H. G. Bowen, M.B.E., to No. 57 Sqdn., Netheravon, 20.10.31. T. C. Luke, M.C., to No. 18 Sqdn., Upper Heyford, 20.10.31. J. W. Jones, to School of Army Co-operation, Old Sarum, 19.10.31.

Flight Lieutenants: E. S. Burns, to Air Ministry (D. of T.), 19.10.31. T. C. Traill, D.F.C., to No. 58 Sqdn., Worthy Down, 19.10.31. J. McGuinness, to No. 503 Sqdn., Lincoln, 20.10.31. N. H. D'Aeth, to R.A.F. Base, Calshot, 16.10.31. W. J. Pearson, to No. 18 Sqdn., Upper Heyford, 20.10.31. W. Dickson, D.S.M., to R.A.F. Depot, Uxbridge, 30.9.31.

Flying Officers: E. C. Lewis, to H.Q., Iraq Command, Hinaidi, 16.10.31. J. T. Mynors, to No. 30 Sqdn., Mosul, Iraq, 16.10.31. S. L. Blunt, to No. 57 Sqdn., Netheravon, 20.10.31. N. A. Tait, to R.A.F. Base, Gosport, 16.10.31. D. G. P. Fitzpatrick, to No. 23 Sqdn., Kenley, 28.8.31. G. R. A. Elsmie, to R.A.F. Depot, Uxbridge, 11.9.31.

Stores Branch

Flying Officer H. E. Freeston, to Aircraft Depot, Hinaidi, Iraq, 16.10.31.

Accountant Branch

Flight Lieutenant A. C. Lobley, to Station H.Q., Hinaidi, Iraq, 16.10.31.

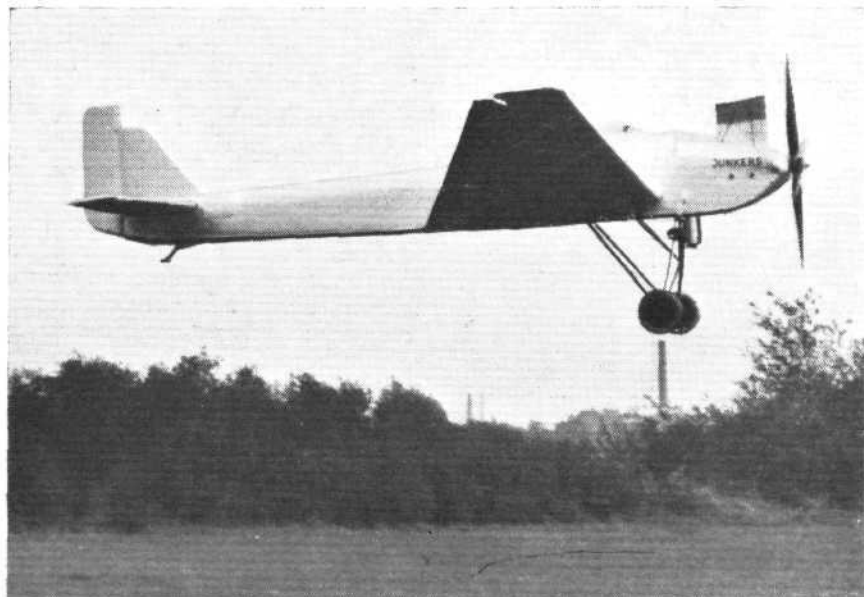
Medical Branch

Squadron Leader W. E. Hodgins, to H.Q., Iraq Command, Hinaidi, 16.10.31. **Flight Lieutenants:** J. G. Russell, A. Dickson, J. MacC. Kilpatrick, all to H.Q., Iraq Command, Hinaidi, 16.10.31. F. W. Goodread (Quartermaster, Medical), to R.A.F. General Hospital, Hinaidi, Iraq, 16.10.31. P. J. Nyhan, to Station H.Q., Boscombe Down, 1.11.31.

Flying Officers: E. A. Gudgeon, to Station H.Q., Hawkinge, 3.11.31. F. I. G. Tweedie, to Medical Training Depot, Halton, on appointment to a short service comms., 12.10.31.

Chaplains Branch

Rev. G. H. Piercy, M.A., to No. 5 Flying Training School, Sealand, 9.10.31. Rev. W. T. Rees, B.D., to H.Q., Iraq Command, Hinaidi, 16.10.31.



THE JUNKERS ALTITUDE MONOPLANE: These two views of the Ju. 49 show the machine to be generally similar to previous Junkers types. The main exception, in external appearance, is the undercarriage. At present the machine is being tested as an ordinary aircraft at normal altitudes, and it will be some time before the final altitude equipment, supercharger, &c., is installed.

